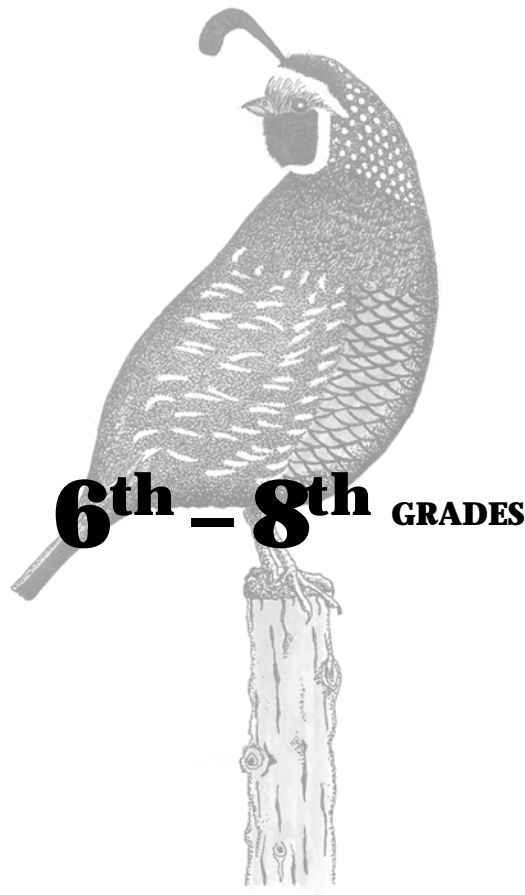




Identifying Resident Birds

at Point Reyes National Seashore



This project was made possible by funding from:



Publishing Information

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This curriculum guide was funded with grants through the National Park Foundation.

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The listing of a resource in this curriculum does not presume its endorsement by the National Park Service.

This guide may be obtained by participating in a teacher workshop at Point Reyes National Seashore or through a teacher in-service training at your school.

Teachers are encouraged to offer their feedback by filling out the enclosed evaluation form or contacting Point Reyes National Seashore directly.



Printed on recycled paper using soy-based inks.

ISBN: 0-911235-10-8

Preface

The intent of these guides is to provide middle school students with the opportunity to observe natural processes at Point Reyes National Seashore so they might take a greater interest in environmental stewardship and science. Teachers from fifteen area schools developed and field-tested seven “Creating Coastal Stewardship through Science” guides for classroom and field trip use. Each guide is carefully designed to facilitate a hands-on learning experience using science and the environment. Natural resources such as Pacific gray whales, northern elephant seals, tule elk, California quail, Douglas iris, and the San Andreas Fault are highlighted because they are easy to identify and to observe. All activities are linked to the California State Science Standards (2000) and the National Science Standards.

You may use this guide alone or in conjunction with other guides. We highly recommend that whenever you use a guide, you use the pre-visit activities to fully prepare the students for the field trip. These activities address student safety, wildlife observation techniques, equipment use, field journal development, and concepts that need to be taught prior to the Park visit. Use of the post-visit activities is also critical to the learning process because they guide the students in making scientific deductions and in developing their environmental stewardship ethics.

Following this preface, you will find background information on the National Park Service and an overview of Point Reyes National Seashore. To provide your students with a better understanding of the place they will be visiting, we recommend you share this information with them. For an in-depth overview of the National Park Service, visit our website at **www.nps.gov**.

Point Reyes National Seashore provides outstanding opportunities for learning about natural and cultural resources. There are also exceptional educational opportunities provided by Park partners such as the Point Reyes Bird Observatory, Audubon Canyon Ranch, and Point Reyes National Seashore Association. To learn more about the Park and our partners, visit our website at **www.nps.gov/pore**.



THE NATIONAL PARK SERVICE

The National Park Service cares for special places saved by the American people so that all may experience our heritage.

Experience Your America

On August 25, 1916, President Woodrow Wilson signed the act creating the National Park Service, a new federal bureau in the Department of the Interior responsible for protecting the 40 national parks and monuments then in existence and those yet to be established.

This “Organic Act” of 1916 states that “the Service thus established shall promote and regulate the use of Federal areas known as national parks, monuments and reservations . . . by such means and measures as conform to the fundamental purpose of the said parks, monuments and reservations, which purpose is to conserve the scenery and the natural and historic objects and the wild life therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations.”



Olympic National Park



Golden Gate National Recreation Area

The National Park Service still strives to meet these original goals, while filling many other roles as well: guardian of our diverse cultural and recreational resources; environmental advocate; world leader in the parks and preservation community; and pioneer in the drive to protect America’s open space.

The National Park System of the United States comprises over 379 areas covering more than 83 million acres in 49 states, the District of Columbia, American

Samoa, Guam, Puerto Rico, Saipan, and the Virgin Islands. Although not all parks are as well known as the Grand Canyon and Yellowstone, all are areas of such national significance that they have been included in the National Park Service — ancient ruins, battlefields, birthplaces, memorials, recreation areas, and countless other wonders. Point Reyes National Seashore is one of ten national seashores.



Mesa Verde National Park



Grand Canyon National Park

The future of the National Park System lies in understanding and protecting its meanings, values, and resources. Each part of the system represents the United States and a part of our heritage. Preservation of individual sites and the entire system will ensure the essence of quality remains in our lives and the lives of all future generations.



POINT REYES NATIONAL SEASHORE



Bruce Farnsworth

Point Reyes National Seashore was established to preserve and protect the natural and cultural features and natural ecosystems along the diminishing undeveloped coastline of the western United States. Located just an hour's drive from a densely populated metropolitan area, the Seashore is a sanctuary for countless plant and animal species. With half of Point Reyes National Seashore designated as wilderness, it provides a sanctuary for the human spirit—for discovery, inspiration, solitude, and recreation—and a reminder of the human connection to the land.

Point Reyes National Seashore comprises over 71,000 acres, including 32,000 acres of wilderness area. Estuaries, windswept beaches, coastal scrub, coastal grasslands, salt marshes, and coniferous forests create a haven of 80 miles of unspoiled and undeveloped coastline located just an hour's drive from an urban area populated by seven million people. Abundant recreational opportunities include 140 miles of hiking trails, backcountry campgrounds, and numerous beaches.



Sue Van Der Wal

The San Andreas Fault separates the Point Reyes Peninsula from the rest of the North American continent. Granite bedrock found here and not found again until the Sierra Nevada range suggests the Peninsula is geologically dynamic. According to geologists, the land that is now called Point Reyes has moved some 300 miles northwest over a period of 100 million years and is still moving.



Rich Salkin

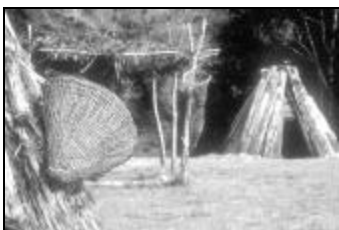
As wildland habitat is developed elsewhere in California, the relevance of Point Reyes as a protected area with a notably rich biological diversity increases. Over 45% of North American avian species and nearly 18% of California's plant species are found here. Point Reyes also contains some examples of the

world's major ecosystem types. For this reason, and because Point Reyes is dedicated to the conservation of nature and scientific research, it was recognized in 1988 by the United Nations Educational, Scientific, and Cultural Organization (UNESCO) Man and the Biosphere program and named as part of the Central California Coast Biosphere Reserve.



Bruce Farnsworth

The cultural history of Point Reyes spans many lives and ways of living with the land. The Coast Miwok people are the first known residents of this peninsula. Archeologists have identified over 100 village sites in the Seashore and cultural traditions are still celebrated in the Park annually. Overlapping the Coast Miwok were Mexican land grantees, lighthouse keepers, and lifesaving station crews. To this day, agricultural operations that were built near the turn of the twentieth century continue within the Seashore's pastoral zone.



NPS Collection



Educational Opportunities at POINT REYES NATIONAL SEASHORE

Point Reyes National Seashore provides an outdoor classroom and learning laboratory for the study of geological and ecological processes and changing land-use values in which a greater understanding of and caring for public lands can be fostered.

Ranger-led Curriculum-based Education Programs

Reservations for Ranger-led programs are requested in writing and assigned on a first-come, first-served basis. Visit nps.gov/pore for the reservation form and calendar.

K-2 Students explore the natural resources of the Seashore with Park Rangers in the Bear Valley area or in their classroom.

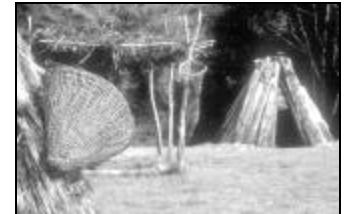


NPS Collection

3-4 Students immerse themselves in the Coast Miwok culture by completing a comprehensive curriculum and visiting the Coast Miwok cultural exhibit, Kule Loklo.



NPS Collection



NPS Collection

4 Students revisit the days of early lighthouse keepers while operating the original Point Reyes Lighthouse clockwork with Park Rangers.



NPS Collection

5 Students study the oceanic influences on the Point Reyes Peninsula by completing a classroom curriculum and viewing gray whales and elephant seals with Park Rangers.

6-8 Students participate in Ranger-led stewardship activities such as habitat restoration, water quality monitoring, and beach cleanups.

Ranger-led Training Programs

9-12 Students become DOCENTS to assist middle school teachers with classroom teaching and use of scientific research tools on Seashore field trips (service learning credits earned).



NPS Collection

Students become RESEARCH ASSISTANTS at the Pacific Coast Learning Center by participating in the inventorying and monitoring of Seashore resources.

Teachers Teacher workshops are offered throughout the year for existing Park curricula and for field trip planning. Visit the Seashore's website at www.nps.gov/pore for a calendar of workshops.



NPS Collection

Classroom and Field Trip Curriculum

Based on the National and State Science and Social Science Standards

3-4



Teacher packets are available for field trips to the recreated Coast Miwok village, Kule Loklo, located near the Bear Valley Visitor Center.

The “Creating Coastal Stewardship through Science” middle school curricula are available to teachers who attend a one-day workshop at Point Reyes or a teacher in-service training.

6-8



Completion of the *Identifying Resident Birds Curriculum*, as a companion to a birdwatching field trip, will enable students to observe and identify different bird species, their habitats, and their behaviors. A visit to Point Reyes Bird Observatory will also enable students to observe bird banding and netting and to understand the most common threats to bird survival.



Completion of the *Monitoring Creek Health Curriculum*, as a companion to a Ranger-led creek program, will enable students to observe and understand the complexity and sensitivity of creek habitats and their role in protecting them.



Completion of the *Discovering Northern Elephant Seals Curriculum*, as a companion to an elephant seal viewing field trip, will enable students to observe and understand the amazing adaptations and behaviors of Northern elephant seals.



Completion of the *Defining Habitats Curriculum*, as a companion to a Park field trip, will enable students to observe and understand the complex land and ocean habitats of the Point Reyes Peninsula and their roles in habitat protection.



Completion of the *Uncovering the San Andreas Fault Curriculum*, as a companion to a geology field trip, will enable students to observe and understand the existence of the San Andreas Fault and the implications it has for area residents.



Completion of the *Investigating Tule Elk Curriculum*, as a companion to an elk viewing field trip, will enable students to observe and understand tule elk behaviors and the issues that surround their management.



Completion of the *Observing Pacific Gray Whales Curriculum*, as a companion to a whale watching field trip, will enable students to observe and understand gray whale adaptations and behaviors, and the factors that influence their survival.

Educational Facilities



The **Historic Lifeboat Station** is available to educational groups for overnight use. Nightly fees are charged. Group size must be under 25 (including chaperones). Reservations are made on a first-come, first-served basis by completing the boathouse form on our website at www.nps.gov/pore.



The **Clem Miller Environmental Education Center** is an overnight facility available by lottery to school groups visiting for multiple-night stays September through May. The facility is used for summer camps during the summer months. Fees are charged. For information, contact Point Reyes National Seashore Association at (415) 663-1200, website www.ptreyes.org.



The **Pacific Coast Learning Center** is a day-use facility located on Highway 1. This facility is used by researchers and students to study the natural and cultural resources of the Seashore.



The **Bear Valley Visitor Center** is a day-use facility open to school groups Monday through Friday from 9 A.M. to 5 P.M. Exhibits on natural and cultural resources are found here. Books, brochures, and other educational materials are available.



The **Ken Patrick Visitor Center** is located on Drakes Beach, approximately 30 minutes from the Bear Valley Visitor Center. This facility is open year-round on weekends and holidays from 10 A.M. until 5 P.M. Ranger-led elephant seal programs meet at this Visitor Center. Exhibits and a 150-gallon saltwater tank are located here. Books, brochures, and other educational materials are available.



The **Lighthouse Visitor Center** is located on the outermost tip of the Peninsula, approximately 45 minutes from the Bear Valley Visitor Center. This facility is open Thursday through Monday from 10 A.M. until 4:30 P.M. (closed Tuesdays and Wednesdays). Ranger-led whale programs and lighthouse tours meet at this Visitor Center. Exhibits on maritime history and whale biology are located here. Books, brochures, and other educational materials are available.



The **Lighthouse** is located below the Lighthouse Visitor Center at the bottom of a 308-step staircase. The lens room is usually open from 2:30 P.M. until 4 P.M. Thursday through Monday or as weather and staffing permit. High winds always close the lens room. Space in the lens room is limited, so reservations are required for groups. Call (415) 464-5100 to confirm existing weather conditions.

Group Camping/Overnight Opportunities

* This listing is provided for your convenience and does not constitute a recommendation or endorsement of any of these facilities.



All overnight camping in **Point Reyes National Seashore** requires a permit and advance reservations. Group sites are very limited and in high demand. Sky, Coast, and Wildcat Camps are all backcountry campgrounds that require hiking to access them. A fee is charged. For more information, visit the Seashore's website at **www.nps.gov/pore**.

The **Point Reyes Hostel** offers a dormitory-style group cabin with a fully equipped kitchen and showers. For additional information and reservations, call (415) 663-8811 during office hours 7:30 to 9:30 A.M. and 4:30 to 9:30 P.M.

Samuel P. Taylor State Park, located 6 miles east of the Seashore on Sir Francis Drake Boulevard, offers campsites for groups. A fee is charged. Reservations are highly recommended. For more information, visit the reservations website at **www.reserveamerica.com**.

Olema Ranch Campground is located half a mile from Seashore headquarters on Highway 1. It is privately owned. Several large group sites are available. Fees are charged. For more information, call (415) 663-8001.

The **Marconi Center** is located 8 miles north of Seashore headquarters on Highway 1. This facility is operated by California State Parks. Lodging, conference rooms, and catered meals are provided for a fee. For more information, call 1 (800) 970-6644 or visit the website at **www.marconiconfctr.org**.



Identifying Resident Birds

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Creating
**COASTAL
STEWARDSHIP**
through Science



Identifying Resident Birds

Teacher Preparation

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Identifying Resident Birds



Teacher Preparation

Point Reyes National Seashore hosts over 470 species of birds, nearly forty percent of all the species found in North America. Migratory and resident birds use Point Reyes in many ways. The Peninsula serves as a breeding ground, a refueling station, and a place for birds to winter. All of this contributes to the phenomenal diversity and abundance found here on a year-round basis. The American Bird Conservancy has named Point Reyes National Seashore as one of “the most 100 globally important bird sites.”

Completion of this unit, as a companion to your Park field trip, will enable students to understand the link between healthy habitats and healthy bird populations for the future.

Considerations

When: Year-round.

Where: Several trails in the immediate area of Bear Valley Visitor Center are ideal for a field visit to view birds (Earthquake Trail, Woodpecker Trail, Bear Valley Trail, or Rift Zone Trail). If you are staying at the Clem Miller Environmental Education Center there are a variety of additional nearby trails and habitats to view terrestrial or shore birds. Contact the Clem Miller director for further suggestions.

How: This unit may be used independently of all other units. If you want to use an additional unit during your visit, we suggest "Defining Habitats" to give students a more complete understanding of other resources at Point Reyes National Seashore and their relationship to resident or migratory birds.

Creating
COASTAL
STEWARDSHIP
through Science



Weather: The chart below lists average climate expectations based on previous year's data. The weather is subject to change quickly and can vary dramatically from different locations within the Seashore on the same day.

	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
Temperature												
Normal Daily Maximum	53	55	55	57	60	62	64	64	65	62	58	54
Normal Daily Minimum	41	42	42	43	47	50	51	52	51	48	45	42
Extreme High	78	85	80	92	94	99	96	96	103	96	81	79
Extreme Low	21	26	29	32	32	39	39	42	39	32	29	18
Precipitation												
Normal	12.0	9.0	8.0	4.0	3.0	1.0	0.3	0.8	2.0	4.0	9.0	12.0
Maximum	20.0	16.0	15.0	11.5	8.0	4.0	2.5	6.0	7.0	13.0	18.0	19.0

Seasonal Events: Consult the chart below to assess which months may be best for a class visit to Point Reyes National Seashore.

	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
Temperature												
Normal Daily Maximum	53	55	55	57	60	62	64	64	65	62	58	54
Normal Daily Minimum	41	42	42	43	47	50	51	52	51	48	45	42
Extreme High	78	85	80	92	94	99	96	96	103	96	81	79
Extreme Low	21	26	29	32	32	39	39	42	39	32	29	18
Precipitation												
Normal	12.0	9.0	8.0	4.0	3.0	1.0	0.3	0.8	2.0	4.0	9.0	12.0
Maximum	20.0	16.0	15.0	11.5	8.0	4.0	2.5	6.0	7.0	13.0	18.0	19.0

Chaperone Preparedness and Assistance

The success of your field trip will depend on your ability to actively prepare and involve your parent chaperones in the field trip activities. Without adult guidance, many of the students will not complete their field journals. It is essential that your field trip have as much structure as your classroom lessons. To accomplish this, we recommend that you assign each parent to a small group of students. Inform each parent that they are responsible for assisting their students with the field observations and with the completion of journal questions. Provide each chaperone with their own copy of the student journals and encourage them to complete it with the students. Also, have each chaperone carry a pair of binoculars and assist students with their use.



Suggested Lesson Plan

Total time needed: 13+ hours

PRE-VISIT		Time Needed: 7 hours
Activity #1	How Can I Learn About Birds at Point Reyes National Seashore? <i>Students use a newspaper and vocabulary list to complete questions and activities about resident birds.</i>	2 hours
Activity #2	What Resident Birds Can I Easily Identify? <i>Student's research and present information about specific resident birds and their identification.</i>	2 hours
Activity #3	What Can We Expect on Our Field Trip to Observe Birds? <i>Students prepare for field trip by reviewing expectations and creating field journals.</i>	1 hour
Activity #4	Safety and Stewardship Challenge <i>Proper behaviors around National Park resources are examined in a game format.</i>	1 hour
Activity #5	How Do I Use Binoculars? <i>A successful field trip starts by ensuring all students know how to use binoculars.</i>	1 hour
ON-SITE		Time Needed: 2 hours
Field Journal	What Is the Diversity of Birds Found at Point Reyes National Seashore? <i>Students complete their field journals by performing various surveys and general observations.</i>	2 hours
Optional Onsite Activity	How Can I Capture My Experiences in a Story, Poem, or Drawing? <i>This is an optional field journal sheet for students to explore emotional connections to the resources.</i>	30 min.
Optional Field Visit	How Can I Participate in Bird Banding at the Point Reyes Bird Observatory? <i>A trip to the Observatory can be scheduled on the same day as your trip to the National Seashore or as a separate trip.</i>	2 hours
Optional Onsite Activity	How Can We Inspire Others to Protect Birds and Their Habitat? <i>Classes may choose to videotape segments of field trip to use as a tool for teaching others.</i>	15 min.
POST-VISIT		Time Needed: 2+hours
Activity #1	What Can We Learn from Our Field Journals? <i>Students compile data from their field journals to draw conclusions between what they have previously learned in class and what they experienced in the field.</i>	2 hours
Activity #2	How Can I Choose and Complete the Best Stewardship Project? <i>Students assess their skills and develop action plans to complete a project that will benefit birds and their habitat.</i>	time varies



Field Trip Logistics

Things To Remember		
<i>Students need:</i>	<i>Teachers need:</i>	<i>Chaperones need:</i>
<input type="checkbox"/> rain gear	<input type="checkbox"/> rain gear	<input type="checkbox"/> rain gear
<input type="checkbox"/> warm, layered clothes	<input type="checkbox"/> warm, layered clothes	<input type="checkbox"/> warm, layered clothes
<input type="checkbox"/> gloves and hat	<input type="checkbox"/> gloves and hat	<input type="checkbox"/> gloves and hat
<input type="checkbox"/> sunscreen and sunglasses	<input type="checkbox"/> sunscreen and sunglasses	<input type="checkbox"/> sunscreen and sunglasses
<input type="checkbox"/> bag lunch with drink	<input type="checkbox"/> bag lunch with drink	<input type="checkbox"/> bag lunch with drink
<input type="checkbox"/> water	<input type="checkbox"/> water	<input type="checkbox"/> water
<input type="checkbox"/> waterproof boots or tennis shoes	<input type="checkbox"/> waterproof boots or tennis shoes	<input type="checkbox"/> waterproof boots or tennis shoes
<input type="checkbox"/> clipboard with field journal and pencil	<input type="checkbox"/> map with directions	<input type="checkbox"/> map with directions
<input type="checkbox"/> permission slip	<input type="checkbox"/> pencil sharpeners and extra pencils	
	<input type="checkbox"/> teacher backpack and field trip kits from Bear Valley Visitor Center	
	<input type="checkbox"/> first aid kit	
Optional:		
<input type="checkbox"/> small backpack	<input type="checkbox"/> small backpack	<input type="checkbox"/> small backpack
<input type="checkbox"/> binoculars	<input type="checkbox"/> binoculars	<input type="checkbox"/> binoculars
	<input type="checkbox"/> camcorder/ camera	<input type="checkbox"/> camcorder/ camera

Other Things to Remember:

- Have students bring a bag lunch since you will be visiting during lunch time.
- If you have a student with accessibility concerns, please call the Park for suggestions.
- Students need warm, waterproof clothing most of the year. Sunscreen is needed on most days. Students should always be prepared for all types of weather.
- Have the students wear long pants and closed-toe shoes, preferably tennis shoes.
- Binoculars will assist the students in viewing the wildlife. These may be checked out from the Bear Valley Visitor Center. If you plan to use this equipment, it is essential that you train the students to use binoculars before their visit. See the enclosed binocular lesson.
- Bathrooms, drinking water, and the Bird Kits are available at the Bear Valley Visitor Center. This should be your first stop when visiting Point Reyes National Seashore.



Evaluation Process

We need your help! Since this guide was designed for your use, only your feedback will make it work. Following the unit overview is an evaluation form. Please complete and return it to:

Point Reyes National Seashore
Division of Interpretation
Point Reyes, CA 94956

If you prefer to be interviewed over the phone about your experience, please phone (415) 464-5139 and request to speak with the project coordinator.

In addition to the evaluation forms, we encourage other types of feedback. Please send any of the following items from your students:

1. Videotape or photos of park field trip
2. Completed student journals
3. What Can We Learn from Our Field Journal? completed student sheets
4. Any completed stewardship activities, including posters, murals, newsletters, etc.
5. A class portfolio illustrating various pre-visit activities, photographs, or drawings
6. Any completed classroom projects or photographs of projects
7. Any other ways to illustrate student feedback

Please indicate if these items need to be returned. We will use them to create a project library, highlight classroom efforts on our website and in Park publications, and complete evaluations of student outcomes.

Reservations

To avoid conflicts with other groups and to be notified about any unusual closures, please call the Park to notify us about your field trip date and time. See the reservation form following this unit overview.

Bird Kit Contents

Kits are available for checkout at the Bear Valley Visitor Center. These are available on a first-come, first-served basis.

Bird Kit contents:

- ☐ 20 pairs of Binoculars
- ☐ assorted field guides
- ☐ first aid kit
- ☐ clipboards
- ☐ spotting scope



Teacher Preparation

California Science Standards Links

	"Identifying Resident Birds" Unit							
	Pre-Visit					On-Site	Post-Visit	
	#1	#2	#3	#4	#5	Field Journal	#1	#2
Sixth Grade								
1								
2								
3								
4								
5	a,b,- e	c,e				a,b,e	e	
6								
7	b,c	b	a,h	b	b	b	b,d,- e	
Seventh Grade								
1								
2								
3	e							
4								
5	a,d					a		
6					b,d			
7	a,d	a,b	a	a	a	a	a,b,- c	a,b,- c,e
Eighth Grade								
1								
2								
3								
4								
5								
6								
7								
8								
9	b		b				b	





Correlations to "A Child's Place in the Environment"
California's State Approved Environmental Education Curriculum

	"Identifying Resident Birds" Unit							
	PRE-VISIT					ON-SITE	POST-VISIT	
	#1	#2	#3	#4	#5	Field Journal	#1	#2
A Child's Place in the Environment: Grade 6 Lessons								
What Are Some Components of an Ecosystem?	x		x			x		
What Role Does Diversity Play in an Ecosystem?	x	x				x	x	
How Does the Sun's Energy Flow Through an Ecosystem?						x		
What Interrelationships and Niches Can Be Identified in an Ecosystem?						x	x	
What Cycles Exist in an Ecosystem and How Do They Sustain an Ecosystem?						x		
What Examples of Ecological Principles Can Be Observed in an Ecosystem?	x					x		
What Are the Components and Relationships of Human Communities and How Do They Compare to Ecosystems?								
What Are Some Limiting Factors in Human Communities and in Ecosystems?							x	
How Do Energy Sources Used in Human Communities Compare to Those Used in Ecosystems?								
How Can Organic Solid Waste in Human Communities Be Composted?								
How is Land Used by Our Community and How Are Land-Use Decisions Made?								
How Can the Disposal of Solid Waste Affect the Quality of the Environment?								
How Does the Motor Vehicle Transportation System Affect the Environment?								
How Do Human Beings Affect Watersheds?								
What Human Actions Enhance, Protect, and Sustain the Quality of the Environment?	x		x	x				x
What Have Communities Done to Become More Sustainable?								x
What Projects Can Students Implement to Make Their Classroom and School or Community More Sustainable?								x



Acknowledgments

This unit was written by area teachers, park rangers, scientists, and area naturalists. Special thanks to the following people:

Workshop Participants

Melissa Pitkin, Education Director
Rich Stallcup, Founder and Ornithologist
Trudie Behr-Scott, Teacher, Hill Middle School, Novato
Sylvia Terry, Teacher, Pine Crest School, Sonoma
Scott Wolland, Director of Clem Miller Education Center

Point Reyes National Seashore, Division of Interpretation/Education

Lynda Doucette
Daisy Martin
John Dell'Osso
Lynne Dominy
Christie Denzel Anastasia

Unit Evaluation

Alan Gere, Retired Teacher, Novato
Trish Corsetti, Tomales School, Tomales

Unit Design

Lynne Dominy
Christie Denzel Anastasia

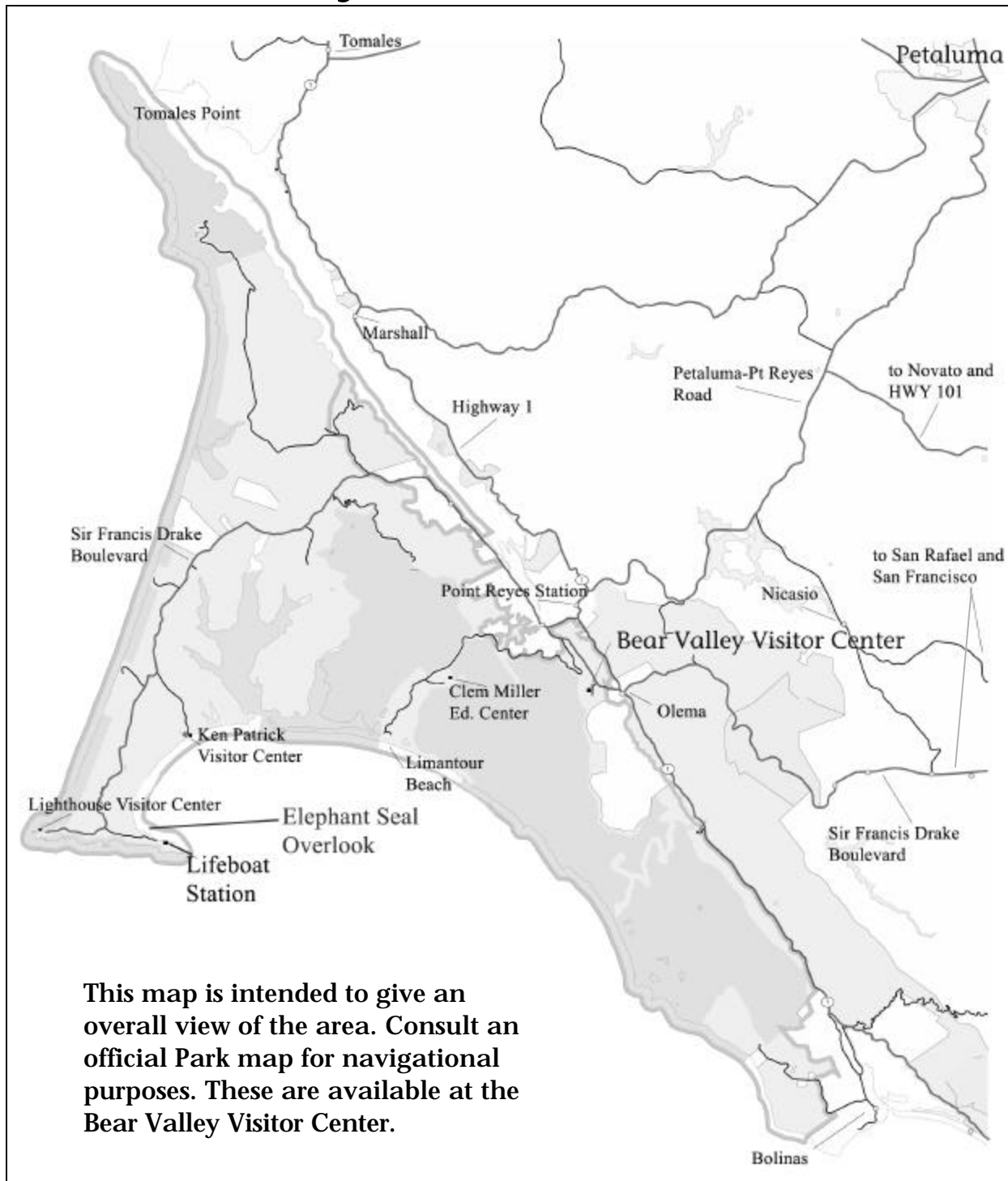
Special Thanks

Lisa Halton, Artist
Thomas Wood Parsons, Cartographer
Rahel Fischer, copyeditor
Sue Abbott, Education Specialist, Point Reyes Bird Observatory
Dawn Adams, Biologist, National Park Service

Point Reyes National Seashore



Attachment



Approximate Driving Times/Distances

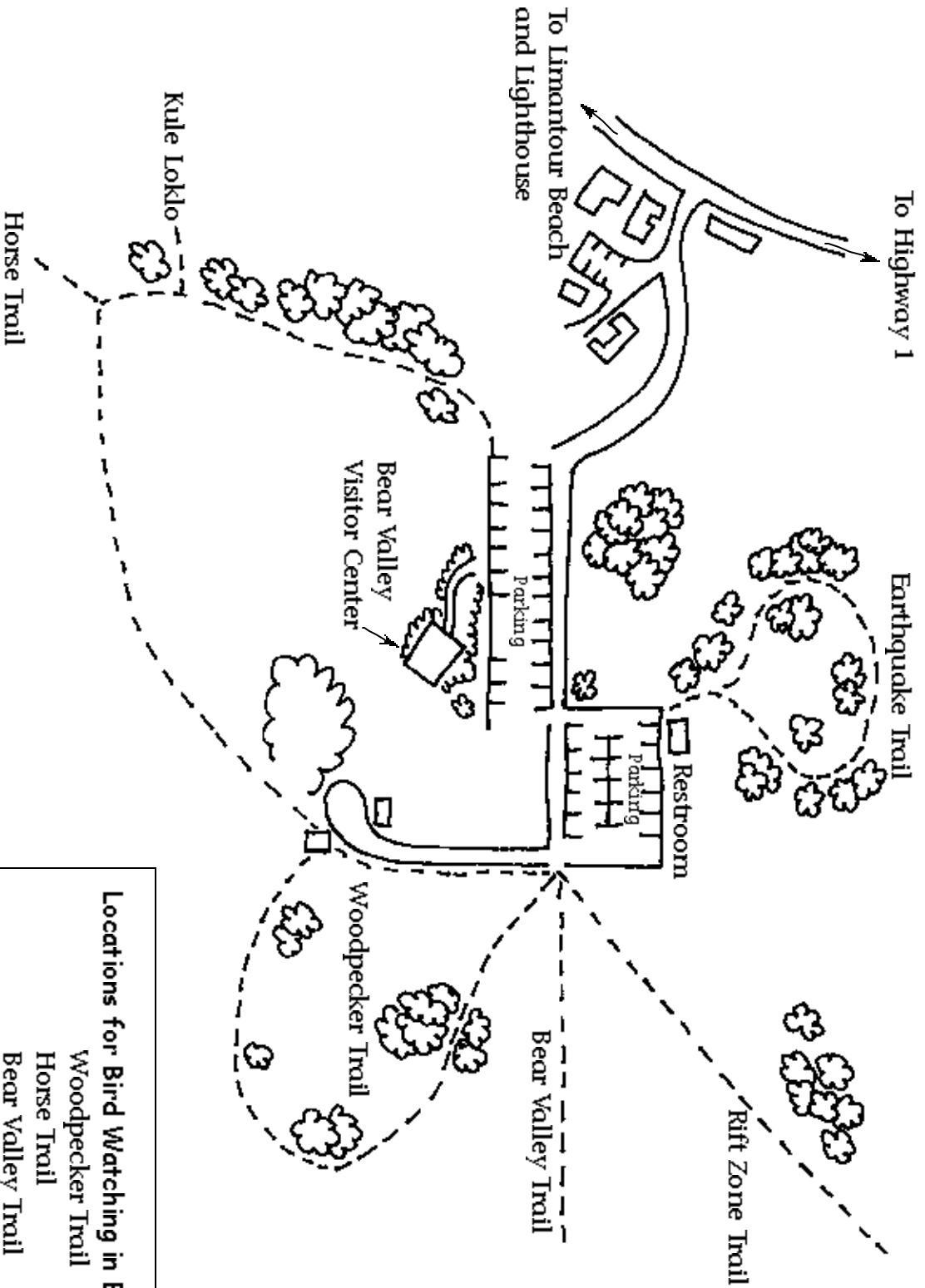
Petaluma to Bear Valley VC	40 min./19 miles
Novato to Bear Valley VC	40 min./19 miles
San Anselmo to Bear Valley VC	30 min./20 miles
Bear Valley VC to Limantour Beach	20 min./9 miles
Bear Valley VC to Tomales Point	30 min./19 miles
Bear Valley VC to Ken Patrick VC	30 min./15 miles
Bear Valley VC to Elephant Seal Overlook	45 min./22 miles

POINT REYES NATIONAL SEASHORE





Bear Valley Visitor Center Area Map



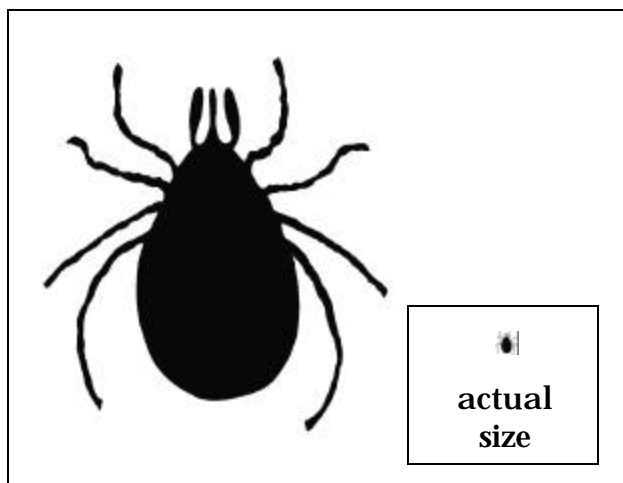
Locations for Bird Watching in Bear Valley:

- Woodpecker Trail
- Horse Trail
- Bear Valley Trail
- Kule Loklo
- Rift Zone Trail



Lyme Disease, Stinging Nettle, and Poison Oak

Lyme disease is an illness caused by bacteria transmitted to people by tick bites. Not all ticks carry the disease. Field studies in Marin County show that 1–2% of the western black-legged ticks carry Lyme disease. Since there are several other species of ticks in Marin, the odds of a tick bite producing Lyme disease is less than 1 in 100. Even so, Lyme disease can be severe; it is important to understand the prevention and symptoms.



Symptoms:

arthritis and joint pain
lethargy
heart problems
pain/limping
fever
kidney problems
depression
bull's-eye rash (50% of victims)

Tick species in California include:

Western black-legged tick and Pacific coast tick (West Coast)
Lone star tick and American dog tick (throughout U.S.)

How to avoid tick bites:

- Wear light-colored, long-sleeved clothes so you can more easily see the ticks.
- Tuck shirt into pants and pants into socks to keep ticks away from your skin.
- Stay on trails.
- Apply an insect repellent, labeled for ticks, to shoes, socks, and pants.
- Check yourself completely after a hike. Closely check any skin irritation. Ticks anesthetize the skin before biting so you'll seldom feel the original bite.

What to do if bitten:

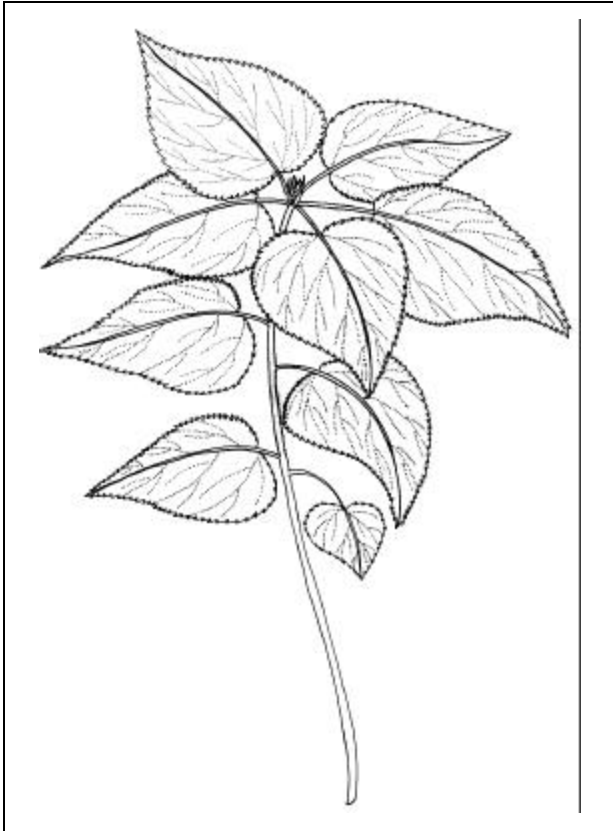
- Use tweezers to grasp tick at point of attachment, as close to skin as possible. Gently pull tick straight out.
- Save tick, notify your doctor.
- Don't panic— ticks need to be embedded from 24 to 48 hours to transmit bacteria. The ticks that transmit Lyme disease are usually in a developmental phase in which they are smaller than the head of a pin.

References:

Ticks and Lyme Disease in the National Parks
Lyme Disease Foundation/www.lyme.org

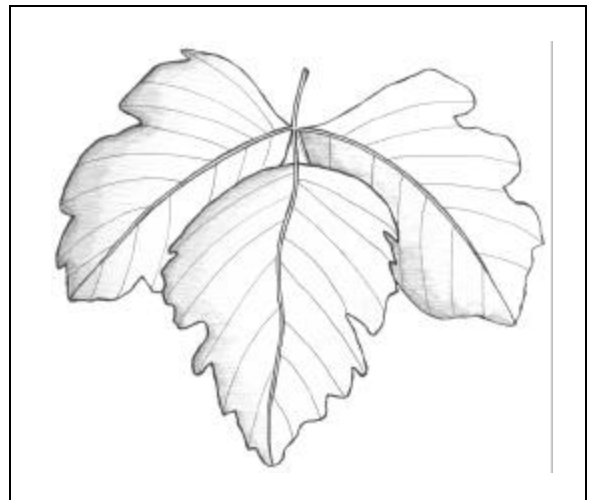


Lyme Disease, Stinging Nettle, and Poison Oak



Stinging nettle is native to Europe, but grows at Point Reyes National Seashore. It can cause a painful rash that stings for up to 12 hours after brushing up against the plant. A topical analgesic (used to treat poison ivy or bug bites) can be applied to help alleviate the sting. Study the picture and have someone point out the plant in the Seashore to aid in its identification.

Poison oak usually causes an itchy rash if you are sensitive to it. You can get a rash by touching the plant, its leaves, or its roots. You can also contract poison oak by petting your dog (if the oils are on its coat) or by touching clothing that has touched poison oak. Rashes may occur several days after the initial contact with the plant. Severe rashes may affect the lungs. If you have difficulty breathing, call 911 or go to the nearest emergency room immediately. Preventive topical ointments are available to help avoid reactions to poison oak. Learn to recognize the compound leaves with a shiny appearance.



Creating Coastal Stewardship through Science



Reservation

If you are planning a trip to Point Reyes National Seashore to use this curriculum, please notify the Park to avoid conflicts with other groups and to be notified about any unusual closures. Mail this form at least 2 weeks in advance (fold in thirds and affix postage) or call (415) 464-5139, to leave a message.

Teacher Name: _____

School Name: _____

School Address: _____

City/State: _____ Zip Code: _____

School Phone: _____ School Fax: _____

Email: _____

Grade: _____ Class Size: _____

Home Phone: _____

Field Trip Options

Monitoring Creek Health

Observing Pacific Gray Whales

Discovering Northern Elephant Seals

Defining Habitats

Investigating Tule Elk

Uncovering the San Andreas Fault

Identifying Resident Birds

Field Trip Preferences

Field Trip Topic

Dates

Time

(list three in order of preference)

1. _____

2. _____

Comments

_____ Confirmation Letter

_____ Materials Sent



**National Park Service
Point Reyes National Seashore
Division of Interpretation
attn: Education Program Coordinator
Point Reyes Station, California 94956**



Creating Coastal Stewardship through Science

Please help us develop and improve our programs by taking a few minutes to complete this form. This evaluation form is preaddressed, but needs to be folded in thirds and provided with postage. If you prefer, e-mail comments to:

PORE_Education@nps.gov

Name: _____ School Name: _____

School Address: _____

City/State/Zip Code: _____

School Phone: _____ School Fax: _____

Email: _____

Class Size/Grade: _____

Date of Visit: _____ Program/Location: _____

Getting Your Visit Set Up

Do you have any suggestions to make logistics easier? (maps, directions, reserving programs)

Curriculum Materials

Which lessons were the most effective?

Relevance of content to my students and curriculum:

Grade appropriateness?

Program Assessment

How does this program fit into California/National Standards and your personal education program?

Strengths/weaknesses of program?

Best part of experience?

What is the level of support at your school for this program?

What could the National Park Service do to improve your education program?

Overall, how would you respond if a colleague asked about this program?

Highly recommended Recommended Recommended with some qualifications
Not recommended



**National Park Service
Point Reyes National Seashore
Division of Interpretation
attn: Education Program Coordinator
Point Reyes Station, California 94956**



Banding	placing a band, like a bracelet, on a bird's leg. The band has a unique number not shared by another bird of the same species, thus allowing biologists to identify that bird as an individual. Banding a bird is like giving it its own name.
Call	a simple sound, often one or two notes, that a bird makes when alarmed or frightened, when flying, when trying to find its flock, or when communicating with another bird
Conservation	the use of a natural resource in a way that assures its continued availability
Crown	the top of a bird's head
Display	a pattern of behavior shown by birds to one another that often includes ruffling feathers, flapping wings, swaying back and forth, raising crest feathers, aerial maneuvers, chasing another bird, etc. There are two main types of displays: territorial displays or breeding displays to attract mates.
Diversity	the array of species present and their spacial distribution
Endangered species	a species in danger of extinction throughout all or a significant part of its range
Eye ring	a circle of color that looks like a ring around the eye of a bird
Flocking	certain species of birds do some of the behaviors listed above together in a group. When birds of the same species, (or different species) group together and perform certain behaviors, they are called a flock.
Forage	to search for food. The way a bird obtains food (i.e., picking up things from the ground, off a tree etc.).
Guano	a substance composed chiefly of the dung of seabirds or bats, accumulated along certain coastal areas or in caves and used as fertilizer
Habitat	a plant or animal's home - all the living and nonliving things in its environment. Examples are forest, coastal scrub, intertidal zone.



Vocabulary

Mandibles	the upper and lower parts of a bird's bill
Migrant	a bird that moves seasonally from one region to another, usually for breeding or feeding
Mist Net	a large net approximately 36 feet long and 6 feet high made of a fine, lightweight material that allows field biologists to catch birds safely. Birds fly into the nets because they cannot see them and are gently held in the net until the biologists remove them, no longer than a half-hour later.
Moustache	a stripe of color, or elongated feathers, that looks like a mustache on the side of the head of a bird
Perch	a bird sitting on a branch, fencepost, or some other type of perch
Plumage	the feathers on a bird
Population	a group of individuals of the same species living in one area
Predator	any organism that exists by preying upon or hunting other organisms
Preening	the act that a bird performs in the care of its feathers; this may involve cleaning, realigning, and applying oil to its feathers. Birds use their beaks to "clean" and spread the oils from their glands onto their feathers to help protect and waterproof them.
Primaries	the set of flight feathers situated on the distal (furthest from the body) segment of a bird's wing.
Raptor	a bird of prey (hawk, owl, falcon) that has a sharp hooked bill and claws or talons on its feet adapted for seizing and tearing prey
Resident	birds that spend all year in one place and do not migrate
Rump	located near the tail feathers of a bird
Secondaries	the set of flight feathers on the second segment of a bird's wing



Singing	singing is different than calling because it is usually a series of notes forming a long "song". Singing is usually only done by male songbirds to announce his territory to other males, and to attract females
Site fidelity	faithfully returning to the same location year after year. For example, a bird may return to the same forest or beach to nest and raise its young each year.
Song	a bird song is usually performed only by male birds during the breeding season. Male birds sing to attract mates and defend territories. Some birds sing on migration or when they first arrive on wintering grounds
Stewardship	taking care of the environment by being involved; taking action and participating in clean ups and education programs, helping others become more aware and making responsible choices
Tarsus	leg bone
Territorial	defending a resource such as an area of land for breeding and/or feeding
Undertail covert	feathers concealing the bases of a bird's tail feathers
Vagrant	a bird that may have made errors in navigation and thus is unexpected in a specific area
Wing bar	a line of contrasting color along a bird's wing
Wing covert	the feathers that cover the bases of the flight feathers in birds



Identifying Resident Birds

Pre-Visit Activities

How Can I Learn About Birds at Point Reyes

National Seashore?25

What Resident Birds Can I Easily Identify?51

What Can We Expect on Our Field Trip to

Observe Birds?59

Safety and Stewardship Challenge65

How Do I Use Binoculars?75

How Can I Learn About Birds at Point Reyes National Seashore?



Pre-Visit Lesson Plan

After reading a newspaper on birds of Point Reyes, students complete two activity sheets focusing on understanding and identifying birds. This activity will form the foundation for all other activities, including the on-site visit.

Time required: 2 hours

Location: classroom/homework

Suggested group size: entire class

Subjects: science, biology

Concepts covered: habitats, life cycles, adaptations, resource protection

Written by: Christie Denzel Anastasia, National Park Service

Last updated: 01/27/02

Student Outcomes

At the end of this activity, the students will be able to:

- Complete activity sheets based on their comprehension of the *Birds of Point Reyes National Seashore* Newspaper
- Understand how natural and human activities relate to bird populations and their habitats
- Understand the role and importance of students and Point Reyes National Seashore in conserving migrant and resident birds

California Science Standards Links (grades 6-8)

This activity is linked to the California Science Standards in the following areas:

- 6th grade
- 5a - food webs
 - 5b - organisms and the physical environment
 - 5e - resources available and abiotic factors
 - 7b - appropriate tools and technology to perform tests, collect data, and display data
 - 7c - develop qualitative statements about the relationships between variables





- 7th grade 3e - extinction of a species occurs when the environment changes and the adaptive characteristics for a species are insufficient for its survival
5a - animals have levels of organization for structure and function
5d - reproduction
7a - appropriate tools and technology to perform tests, collect data, and display data
7d - construct scale models and appropriately labeled diagrams to communicate scientific knowledge
- 8th grade 9b- evaluate the accuracy and reproducibility of data

National Science Standards Links (grades 5-8)

This activity is linked to the National Science Standards in the following areas:

- Content Standard A - Think critically and logically to make the relationship between evidence and explanations
- Content Standard C - Structure and function in living systems; Reproduction and heredity; Regulation and behavior; Populations and ecosystems; Diversity and adaptations of organisms
- Content Standard F - Science and technology in society

Materials

To be photocopied from this guide:

- **Pre- and Post-Evaluation** Activity Sheet
- *Birds of Point Reyes National Seashore* Newspaper
- **Vocabulary** sheets located in Teacher's Preparation/Attachments
- **Understanding Birds** Activity Sheet
- **Identifying Birds** Activity Sheet

Vocabulary

diversity, migrant, predator, site fidelity, territorial, vagrants

Procedures

1. Pre- and Post-Evaluation

Distribute **Pre- and Post-Evaluation** activity sheets. Remind students this is not a graded test, but rather a measure of our success; each student will retake the same test after several lessons. (Note: You may choose to save these completed tests and redistribute in the first post-visit lesson. Students change their answers based on what they have learned.)

2. Distribute Newspaper

Students receive and read *Birds of Point Reyes National Seashore* newspaper. Students can work in pairs or individually to complete activity sheets.

3. Reading Comprehension

Read the *Birds of Point Reyes National Seashore* newspaper as a class and clarify any questions or comments from students.



4. Activity Sheets

Give each student appropriate activity sheets, vocabulary list, and instructions for completion.

5. Conclusions

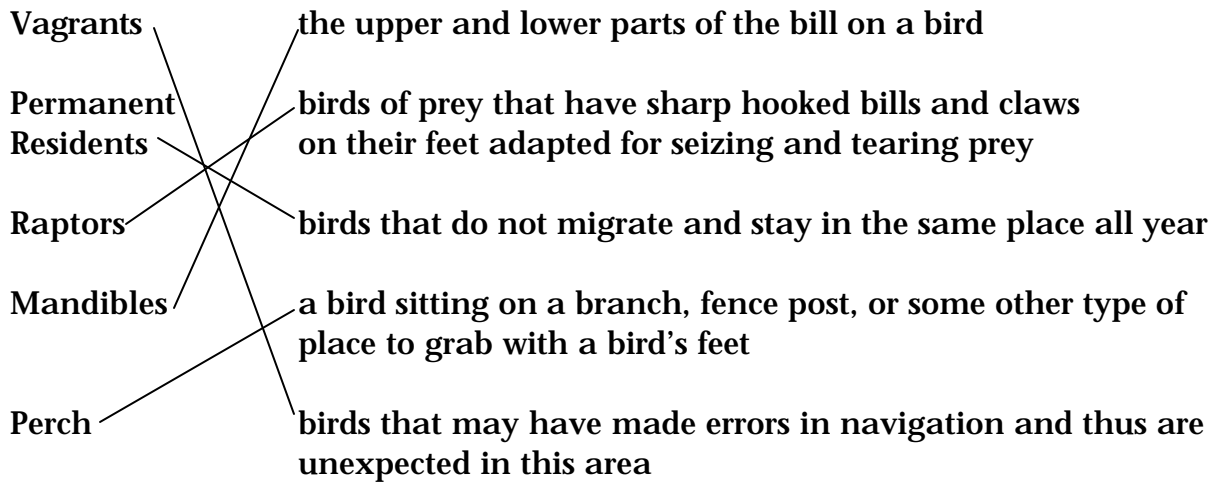
Review students' answers, exchange ideas, and relate these concepts to lessons already covered earlier in the year.



Pre- and Post-Evaluation

Vocabulary Match-Up

Draw connecting lines between words and their definitions.



True or False

Circle "T" for true, "F" for false.

- ☒ F Some birds migrate over 8,000 miles in one day.
☒ F Birds are believed to have evolved from reptiles related to dinosaurs.
☒ F Marin County has a healthy population of Northern spotted owls.
☐ T ☒ F All birds in Point Reyes National Seashore are native to the area.

Increase or Decrease

Do the following actions increase or decrease bird populations in an area? Place an "↑" to indicate increase, and a "↓" to indicate decrease next to each item.

- ↓ oil is spilled in the ocean next to a common murre colony
- ↑ people are informed about protection efforts involving birds
- ↓ habitat is destroyed
- ↑ western snowy plover nesting areas are protected and restored
- ↑ outside areas are made attractive to birds by improving backyard habitat
- ↓ bird eggs are broken or eaten by predators such as gulls, cats, or raccoons

National Park System

Which part of the National Park System is closest to where you live?

***Point Reyes National Seashore,
Golden Gate National Recreation Area, Muir Woods National Monument***

Stewardship

What can you do to preserve individual bird species, their populations, and the habitats they depend on? List your ideas on the back of this paper.

answers will vary

Name _____ Date _____



Pre- and Post-Evaluation

Vocabulary Match-Up

Draw connecting lines between words and their definitions.

Vagrants	the upper and lower parts of the bill on a bird
Permanent Residents	birds of prey that have sharp hooked bills and claws on their feet adapted for seizing and tearing prey
Raptors	birds that do not migrate and stay in the same place all year
Mandibles	a bird sitting on a branch, fence post, or some other type of place to grab with a bird's feet
Perch	birds that may have made errors in navigation and thus are unexpected in this area

True or False

Circle "T" for true, "F" for false.

- T/F Some birds migrate over 8,000 miles in one day.
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Anna's hummingbird

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Birds of Point Reyes National Seashore

Point Reyes National Seashore offers some of the finest birdwatching in the United States with more than 470 avian species observed in the Park and on adjacent waters.



Turkey vulture

- The Park's coastal location and its wealth of unspoiled habitats attract many migrating and wintering birds.
- The projection of the peninsula some 10 miles seaward from the geologic mainland makes Point Reyes National Seashore an attractive landing spot for many migrants and vagrants- birds that may have made errors in navigation and thus are unexpected in this area.
- All of these factors account for one of the highest species diversity in the nation during the annual Audubon Society sponsored Christmas Bird Count and attracts birdwatchers from around the world.

Why Study Birds?

Birds are everywhere! You can find birds in all habitat types around the world.

Birds are easy to hear. By singing their songs, they are announcing their names, over and over, all day long. Much of studying birds is done by hearing them, not even seeing them!

Birds are easy to locate. Since they are everywhere and make a lot of noise, we can easily find them by listening and looking with a pair of binoculars.

Studying birds can teach us about the health of ecosystems. The presence or absence of birds along with how well their population is producing young can indicate to us the health of a particular environment.

Migration...

Migratory Birds - Nature's Superheroes

Every year across the world, millions of birds must travel great distances to get to important destinations: their winter home and their nesting home. Traveling over land and sea using paths called flyways, this miraculous event is called migration. In North America, hundreds of thousands of migratory birds fly north to their nesting home in the spring and back south to reach their warmer winter homes in the fall. Some birds must travel over 8,000 miles - just one way - and some never make it to their destination.

The Busy Life of a Migrant

In a year of a migratory bird's life, it must fly to its nesting home in the spring, find a mate, build a nest, and raise its young. In the late summer or fall, when the young are just months old, the adults and young must safely fly to their winter home in the fall. That's a lot of work to do in such a short period, and there's often no time to waste!

How Do Birds Migrate?

Migratory birds are often physically adapted to fly huge distances. Long

wings and streamlined bodies help birds fly over vast ocean expanses using the wind to save energy. Eventually, however, many birds must stop to rest so that they can refuel with food and water. Incredibly, a small shorebird that nests in the Arctic, called a Western Sandpiper, feeds enough to nearly double its weight to fuel its migration. That's a big appetite! Some migrants travel alone, but many fly in enormous flocks. Perhaps you have noticed a flock of Canada Geese traveling in a "V" shaped formation over you. Since most migrating birds



Black-crowned night heron

journey at night and at high altitudes (2,000 to 8,000 feet above the ground), however, if you are not paying close attention, migration may slip right by you.

Neotropical Migrants - Birds With No Borders

Many migratory birds that nest in the USA and Canada have winter homes in the tropics - in countries from Mexico to Argentina - that are warm and full of food during our colder winter months. These special birds

are called neotropical migrants.

The Point Reyes Migration Pit Stop

Like truckers on a long highway, migrating birds are often familiar with good rest areas, and may use the same sites year after year. And like truckers birds need safe rest stops with enough food to fill their bellies so they can continue their travels. Not only is Point Reyes an important nesting and winter home for birds, the land and sea in and around it provide key rest areas for migratory birds. Many seabirds that nest as far south as New Zealand and as far north as the Bering Sea migrate to the waters off California, including Point Reyes, to feed during part of the year. Without safe rest stops, breeding homes, and wintering homes birds cannot complete their life cycle. Destructive human activities in these important places can disrupt the life cycle of birds if we are not careful. But we can help birds lead healthy lives by learning from our mistakes and changing our behavior.



Great blue heron

...and the Pacific Flyway

The Pacific Flyway is a stretch of sky and land that spans across the Pacific region of the United States, Canada, Central and South America. It is an airborne “highway” to millions of bird “commuters” that must migrate annually to and from their northern nesting grounds in Alaska and Canada.

These birds follow unmarked pathways, using guidance systems that surpass human instruments. Birds use sites along the flyways to feed, rest, or nest and rear their young. These birds migrate hundreds or even thousands of miles southward to their wintering grounds.



Adaptations

Most **feathers** can be classified into three main types: *down feathers* are short and fluffy to help keep the bird warm, *contour feathers* are only fluffy on the lower part and they help shape and protect the bird's body, and *flight feathers* are the longest, stiffest feathers.

Bill shapes and sizes vary greatly among birds. The bill can become highly specialized depending on how it is used. For example, oystercatchers have very stout, long bills used to get at their food enclosed in a shell. Other birds have short beaks that allow

them to open seeds and nuts easily.

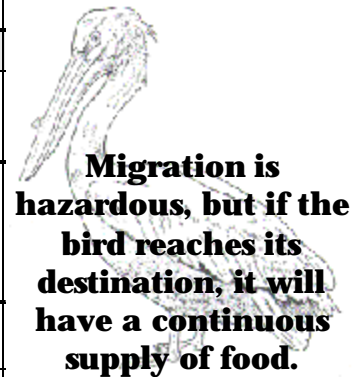
The sense of **smell** is developed to various degrees depending on the type of bird. Some birds can use their sense of smell to locate their burrows (Leach's petrels) while others are able to sniff out their favorite meal of earthworms (Kiwis). There are still many questions concerning the degree of smell in other species such as the vultures. No one really knows how they are able to find rotting food: smell, sight, or a combination of the two. Birds take on their

coloration through the pigments found in their feathers. Most of the bright, showy colors are used to attract members of the same species. Some coloration may have a protective purpose. Many shorebirds that are mostly white have black wing tips. These black pigments make wingtips stronger and may keep the wings protected during windy flights near the ocean.

The black brant flies up to 3,400 miles nonstop from Alaska to Baja California, averaging 60 miles per hour and arriving in less than two-and-a-half days. About 1/3 of the bird's weight is lost during this migration.

Migrant and Resident Birds

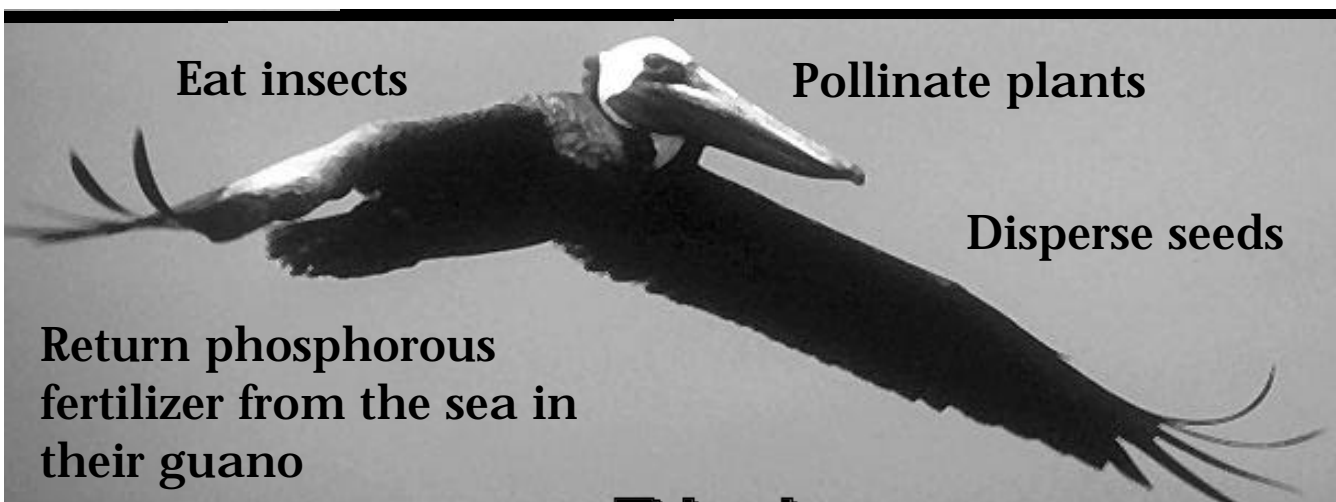
Ocean Habitats				
Habitats	SPRING/SUMMER		FALL WINTER	
	Resident Species	Migratory Species	Resident Species	Migratory Species
Ocean	Common murre Brandt's cormorant	Brown pelican	Common murre Brandt's cormorant	Common loon Canada goose Western grebe
Shore	Snowy egret Great egret Great blue heron Willet (non-breeders)	Willet (breeders)	Snowy egret Great egret Great blue heron Killdeer	Willet Marbled godwit Long-billed curlew American avocet Black-necked stilts
Intertidal	Black oystercatcher		Black oystercatcher	Black turnstone
Estuary/ Lagoon	Mallard Ruddy duck		Mallard Ruddy duck	American widgeon Northern pintail



Migration is hazardous, but if the bird reaches its destination, it will have a continuous supply of food.

Residents have two strategies: stay through the seasonal time of shortage and scrounge for food that is available; or harvest food during the time of supply for the time of need. Birds that store food have to be very careful, the food may be stolen or it may rot.

Land Habitats				
Nesting Habitat	SPRING/SUMMER		WINTER	
	Resident Species	Migratory Species	Resident Species	Migratory Species
Tops of Trees/ Canopy	Red-tailed hawk Osprey	Warbling vireo	Red-tailed hawk Osprey	Golden-crowned Kinglet Ruby-crowned kinglet Yellow-rumped warbler
Tree Trunks	Acorn woodpecker Northern flicker	Tree swallow Ash-throated flycatcher	Acorn woodpecker Northern flicker	
Shrubs	Scrub jay American robin	Black-headed grosbeak	Scrub jay American robin	Fox sparrow
Ground/ Understory	California quail California towhee	Wilson's warbler Swainson's thrush	California quail California towhee	Varied thrush Golden-crowned sparrow Fox sparrow



What Role do Birds Play in an Ecosystem?

What Is a Bird?

All birds have some type of feathers used for flight, protection, and body temperature regulation. All birds have feathers, and no other animal has feathers.

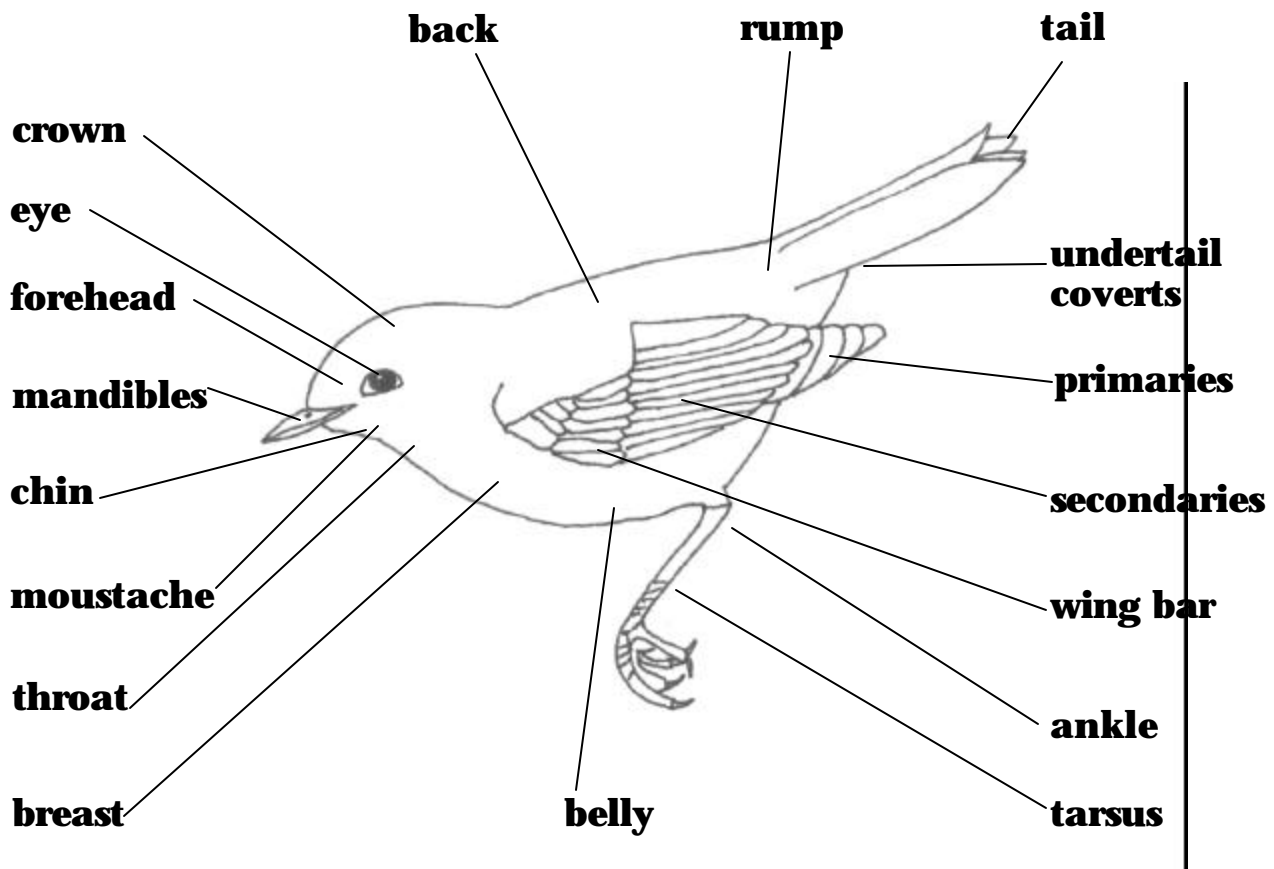
Birds have wings, which are modified forelimbs, for

flight. There are some flightless birds such as the ostriches and penguins. Their wings are used for other purposes, such as balance or swimming flippers.

Birds are warm-blooded

which means they can maintain a constant body temperature independent of the environment's temperature.

Birds have a backbone and internal skeleton making them vertebrates.



Birds are believed to have evolved from reptiles (related to dinosaurs) such as the fossil *Archaeopteryx* which had feathers.



A Rocky Life

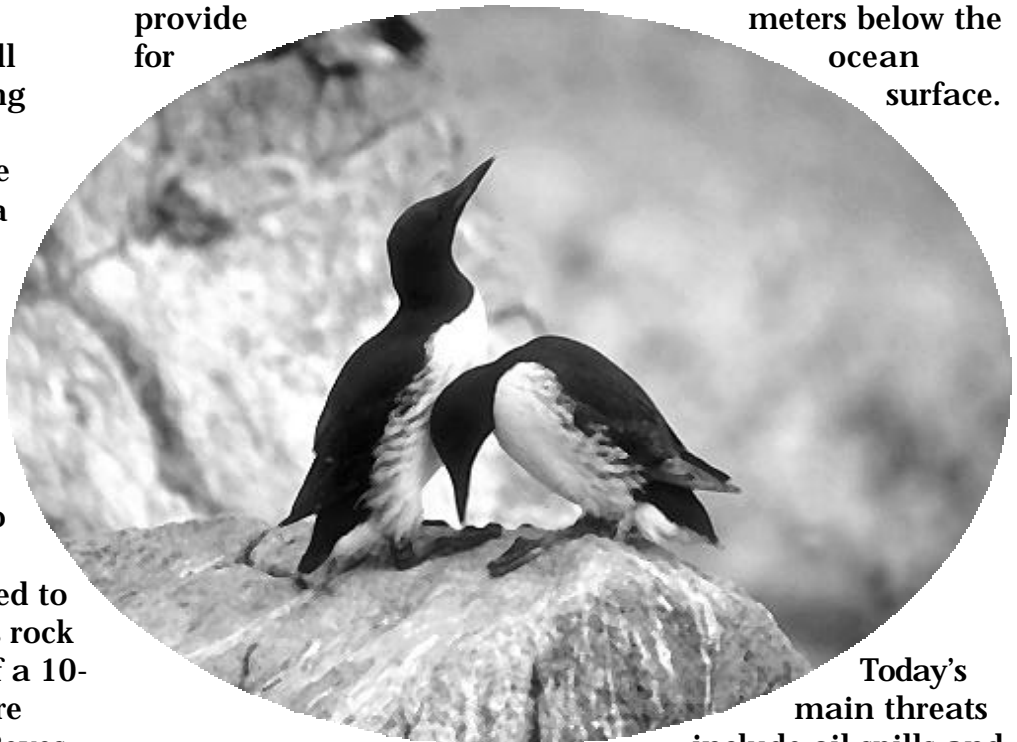
Though Common murre populations were decimated by egg collectors after the California gold rush, and again in the 1980's when approximately 75,000 were killed by gill-net fishing, you can still see these sturdy black and white birds breeding on the rock below the Point Reyes Lighthouse.

In 1986, a combination of ongoing commercial gill-net fishing and the Apex/Houston oil spill wiped out the breeding colony of over 3,000 murre at Devil's Slide Rock south of Pacifica and San Francisco. Court settlements in the form of monetary restitution for damages incurred by the spill are now allowing rehabilitation work to occur at Devil's Slide. No breeding is believed to have occurred on this rock since 1986. As part of a 10-year project, the murre population at Point Reyes will be used as a control site to monitor and compare the return of the Devil's Slide colony.

Common murrens return to nest on or near the same rock from which they fledged. In subsequent years they will not only return to the same rock, but

to the same spot on that rock to breed. This is why the work at Devil's Slide Rock is so crucial. Breeding for murrens begins at 4-6 years of age. Each season a pair lays only one pear-shaped egg. The shape of the egg ensures that if it rolls it will only go around in circles and not over the edge of the cliff. The low egg number allows a better success rate for the young but does not provide for

young bird for about 2 months. This time on the water together has two purposes. First, it allows the parents to use less energy feeding their young, since they do not have to fly back and forth to the top of the rock, and second, the adults can go through a molt (during which they cannot fly) without sacrificing care of the young. Propelled by their wings, murrens forage for fish by diving up to 180 meters below the ocean surface.



Common murre

a quick recovery of populations.

In mid-July when the fledgling is only about one-quarter of its adult weight, it leaps off the breeding rock and into the ocean, followed by its father. The father continues to feed the

Today's main threats include oil spills and disturbance from low-flying aircraft and boats. Overall, Common murre numbers in California are making a slow comeback. However, they have recently been listed by the state as a "species of concern" and have a long road to travel before their populations reach historic levels.

Plover Protection



Western snowy plover

Life History

Have you noticed a small shorebird running across the sand above the tideline when you visit the beach? Perhaps you saw it running across the sand with patter-stop movements, crouching in a depression, or feeding along the line of debris left by high tide. If it ran from you, spreading its wings, while flattening against the ground, you likely were too close to its nest or young.

The Western snowy plover (*Charadrius alexandrinus nivosus*) is a pale-colored, small shorebird. During the breeding season, the male has distinct black markings behind the eye, on the forehead, and on the shoulders. The female has similar markings that are dark brown.

The snowy plovers' nesting habitat is flat, unstable, open areas like dune-backed beaches and sandspits. Plovers breed from mid-March through mid-September, nesting in a depression in the sand constructed and lined with

bits of shell or pebbles. Both sexes share the month-long incubation of the eggs, with the female usually incubating during daylight hours and the male at night. Within hours of hatching, chicks leave the nest and are able to find their own food. The male will brood them and warn them of danger until they can fly. The female may leave to produce a second clutch with another male.

Reason for Decline

Snowy plover populations are declining along the Pacific Coast of the United States. Loss of habitat is the primary cause of their decline. There has been outright loss of habitat due to beach development for residential and recreational use. Introduced European beach grass and ice plant have also reduced plover nesting habitat by spreading over areas of open sand areas, and making beaches steeper and narrower. European beach grass, has also increased protective cover for predators of plover eggs and young.

Loss of nests and young is the second major cause of decline. Predators on eggs and chicks include gulls, crows, ravens, foxes,

coyotes, dogs, cats, skunks, opossums, hawks, and raccoons. Some nest loss to predators and weather is expected, but when it is combined with human disturbance, it can be devastating. Beach visitors, especially with dogs, horses, and vehicles, may not even realize that their presence could flush parents off nests, exposing eggs and young more often to predators, rain, and windblown sand. The greatest human use of the beach (Memorial Day through Labor Day) coincides with the plover breeding season. Well-camouflaged eggs, young, and even adults have been crushed by visitors to California beaches.

Special Status

Snowy plovers are listed as a federally threatened species due to continuing declines in breeding habitat and numbers of birds. At most, only 2,000 Snowy plovers nest along the coasts of Washington, Oregon, and California at present. Point Reyes National Seashore has a conservation plan which includes protecting and restoring nesting areas, monitoring plover populations (and predators), and informing people about protection and recovery efforts.

Northern Spotted Owls

Northern spotted owls (*Strix occidentalis caurina*) usually nest in large, old trees and multi-layered canopies typical of old-growth forests such as those of the Pacific Northwest. They are considered an indicator species because their presence is a gauge of the ecological health of the habitat.



Bird banding

This owl, which is recognized as threatened by the United States government, prospers in the mild climate of coastal California. Possibly the densest known population of Northern spotted owls is found on the public lands in Marin County. The abundance of spotted owls is probably due to a large population of their favorite prey, dusky-footed wood rats (*Neotoma fuscipes*).

Biologists and project volunteers from Point Reyes National Seashore, Golden Gate National Recreation Area,



Biologists measure tail feathers

Muir Woods National Monument, Point Reyes Bird Observatory and Marin Municipal Water District, and Open Space District monitor the population of spotted owls on public lands in the western portion of Marin County. Through long-term monitoring and banding programs, researchers study specific sites, reproductive success, and dispersal of local spotted owls.

Ravens with Antennas?

Look closely at the ravens you see perched on rocky bluffs and fence posts. You may see one with color bands on its legs. In 1998, 12 adult ravens were caught and banded, and 9 were fitted with a harness, small radio transmitter, and antenna. Color-coded antennas and leg bands identify each bird. Field biologists using radio receivers track the raven's movements.

Park biologists, the Point Reyes Bird Observatory,

Audubon Canyon Ranch, and the U.S. Fish and Wildlife Service hope to learn more about the foraging range and habitat preference of Common Ravens at Point Reyes. They are especially concerned with their predatory habits on Common murre colonies and Snowy plover nests at Point Reyes.

The raven is a natural predator in the ecosystem of Point Reyes, but the number of ravens may be artificially inflated due to

human-related activities, which increase food, water, and perch sites. More ravens mean other bird populations may decrease.



Common raven

Point Reyes Bird Observatory

The PRBO Conservation Science (PRBO) is an organization made up of many biologists who study birds, also known as ornithologists. The goal of PRBO is to use the information collected from studying birds to help conserve and protect birds in the environment they need to survive.



PRBO bird banding demonstration

Point Counts Using this survey, a biologist records the number of birds seen or heard at a designated point in a 5- minute period. The biologist is trying to get an estimate of how many birds are in an area, as well as what different kinds of birds are present.

Mist netting This is a method where birds are safely caught in a large nylon net called a mist net in order to be studied. Once the bird is carefully removed from the net, a metal identification band with a number is placed on its leg. Then the bird is measured, weighed, and released safely back into the wild. No two birds in North America have the same number! Mist netting can teach us how long birds live, where they migrate to, and what types of birds are in an area.

Bird Banding The United State Fish and Wildlife Service's Bird Banding Laboratory distributes millions of small metal bands to bird observatories across the nation. Each band is marked with a unique identification number that will be used to gather information about the bird it is attached to. When birds are recaptured by bird banders, found dead, or shot by hunters, information is recorded and sent back to the Bird Banding Laboratory. Researchers are able to learn more about such things as migration patterns and species longevity. Over a million birds are banded annually in North America and about 65,000 bands are recovered.

Nest Monitoring This method for studying birds is like being a detective! A biologist watches birds for clues about where they have hidden their nests. The clues are behaviors the birds perform. Noting these behaviors helps the biologist find the nest. Once found, the biologist carefully monitors or checks the nest every 4 days to see what happens to it. Nest monitoring can teach us how successful birds are at reproducing. And remember, if birds aren't reproducing, their populations will decline. We can also learn how long it takes for chicks to grow to adults, what kinds of predators are preying on birds in the nest, and what type of habitat birds need to build their nests.

Field Observations Perhaps one of the most important ways to study birds is to keep track of observations in a field journal or notebook. Every time biologists are out watching or studying birds, they record everything they see in their notebooks. This includes information such as where they are, what the weather is like, the time of day they saw something, as well as sketches of birds, habitats, and anything else they may encounter.

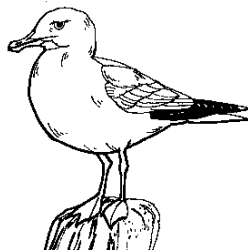
Special Birds

Species of Special Concern



California brown pelican

Northern spotted owl
Western snowy plover
Bald eagle
California brown pelican



Environmental Indicators

Birds are “vital signs” of the environment, meaning they are excellent indicators of changing conditions in the natural world. Like ourselves, birds are at the top of many food webs. In addition, their high metabolic rates make them particularly sensitive to stress or habitat degradation. Birds also serve as indicators of levels of pollutants concentrated in the food chain. These pollutants can potentially impact a birds reproductive success and productivity.

Nonnatives at Point Reyes National Seashore



Rock dove
European starling
House sparrow
Peacock
Wild turkey
Mute swan



Stewardship

What You Can Do to Help Birds and Their Habitats:



- Eliminate poisons in your yard. Many popular pesticides are lethal to birds.
- Attach falcon or owl silhouettes to large windows to help birds distinguish between real sky and the reflection in the window. Millions of birds each year are killed when they fly into windows.
- Consider that cats have never been in the natural food chain in the Western hemisphere. Free-roaming cats kill hundreds of millions of migratory songbirds each year.
- Make outside areas attractive to birds by planting native plants.
- Volunteer...contact local parks, forests, and refuges to learn more about volunteer opportunities.

How You Can Protect Plovers:

- Keep pets leashed, and away from restricted areas. If you are not sure where to go, ask a ranger.
- Keep clear of protective fencing, called “exclosures.” They are made of metal fencing or rope.
- Walk on wet sand near the surf, especially during the summer breeding months. It is easier on your feet and keeps you away from the dry sand habitat of plovers.
- Remove all food and trash from beaches to discourage scavenging predators.
- Leave driftwood posts lying on the sand. These upright posts provide perches for avian predators.
- Become a Snowy Plover Docent and help teach others about plovers and beach habitat.



Western snowy plover, Lisa Halton

Special Thanks



Point Reyes Bird Observatory
Melissa Pitkin, Sue Abbott, Rich Stallcup

Artwork: **Lisa Halton, Christie Denzel Anastasia**
Photographers: **Rich Stallcup, John Dell'Osso**
Writers: **Melissa Pitkin, Rich Stallcup, Dawn Adams**
Design/Layout: **Christie Denzel Anastasia**
Editor: **John Dell'Osso**

Understanding Birds



Use the information in the "Birds of Point Reyes National Seashore" newspaper to answer the questions below.

Common Murres and Western Snowy Plovers

	Reasons for Decline	Actions Taken to Protect Population
Common Murres	<i>egg collection</i> <i>gill net fishing</i> <i>oil spills</i> <i>disturbance from low flying aircraft</i>	<i>rehabilitation work at damaged sites</i> <i>monitoring "control" sites</i>
Western Snowy Plovers	<i>loss of suitable coastal habitat</i> <i>introduction of non-native coastal plants</i> <i>loss of nests, eggs, and young</i> <i>humans scare parents off nests</i>	<i>protecting and restoring nesting areas</i> <i>monitoring populations</i> <i>informing people about protection and recovery efforts</i>

Northern Spotted Owl

Why are Northern spotted owls doing well in Marin County?

- **Large numbers of their favorite prey are present (dusky footed woodrat)**
- **Suitable habitat**

What are researchers studying about Northern spotted owls?

- **Site fidelity (how consistently birds are in returning to the same site)**
- **Reproductive success**
- **Dispersal of local owls**

How are researchers studying Northern spotted owls?

- **Long-term monitoring (knowing locations and numbers)**
- **Bird banding (recognition of individuals and correlation with site)**

Ravens

What are researchers studying about ravens?

- **Foraging range (where and how do they feed)**
- **Habitat preference**
- **Predatory habits on common murre colonies**

How are researchers studying ravens?

- **Antennas, radio transmitter, radio receivers**
- **Leg bands**

Name _____ Date _____



Birds of Point Reyes National Seashore Newspaper Activity

Understanding Birds

Use the information in the "Birds of Point Reyes National Seashore" newspaper to answer the questions below.

Common Murres and Western Snowy Plovers

	Reasons for Decline	Actions Taken to Protect Population
Common Murres		
Western Snowy Plovers		

Northern Spotted Owl

Why are Northern spotted owls doing well in Marin County?

What are researchers studying about Northern spotted owls?

How are researchers studying Northern spotted owls?

Ravens

What are researchers studying about ravens?

How are researchers studying ravens?

Identifying Birds

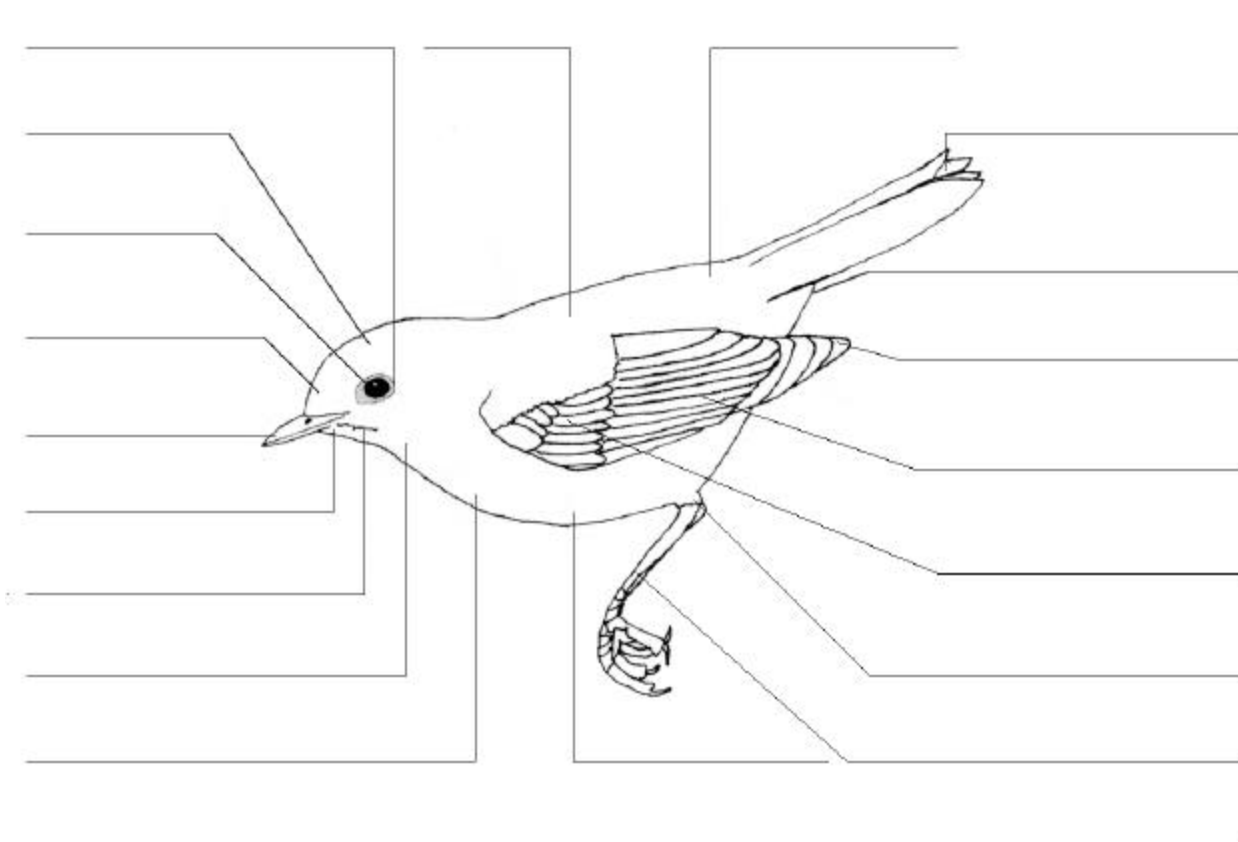


Study the picture of a bird in the "Birds of Point Reyes National Seashore" newspaper showing specific parts used to identify birds. Close the newspaper and try to label the bird with the words listed in the box below.

If you can learn to identify these parts, it will help you use a field guide and discover the names of birds. If you know what bird you are looking at, you can learn more about the bird in a book, and understand the habitat the bird needs to survive.

Remember to save this sheet of paper to include in your field journal for your visit to Point Reyes National Seashore!

tarsus - belly - rump - tail - eye ring - crown - breast - ankle -
primaries - wing bar - mandibles - eye - back - chin - secondaries -
forehead - undertail coverts - moustache - throat



What Resident Birds Can I Easily Identify ?



Pre-Visit Lesson Plan

Student teams will research a specific resident bird and present findings to their class. The five resident birds students will study are among the most likely to be viewed and recognized during their upcoming field trip.

Time required: 2 hours with possible homework assignment

Location: classroom, library

Suggested group size: entire class

Subject: ornithology

Concepts covered: field guides, bird identification

Written by: Lynda Doucette and Daisy Martin, National Park Service

Last updated: 07/06/01

Student Outcomes

At the end of this activity, the students will be able to:

- Familiarize themselves and fellow class members to five most common bird species to be seen on future field visit
- Complete journal pages for identification of birds on the field trip

California Science Standards Links (grades 6-8)

This activity is linked to the California Science Standards in the following areas:

- | | |
|-----------|---|
| 6th grade | 5c - organisms can be categorized by functions
5e - the number and types of organisms an ecosystem can support depends on the resources available and abiotic factors, such as quantity of light and water, range of temperature, and soil composition
7b - appropriate tools and technology to perform tests, collect and display data |
| 7th grade | 7a - appropriate tools and technology to perform tests, collect and display data
7b - utilize a variety of print and electronic resources. |

Creating
COASTAL STEWARDSHIP
through Science





National Science Standards Links (grades 5-8)

This activity is linked to the National Science Standards in the following areas:

- Content Standard A - Identify questions that can be answered through scientific investigation; Use appropriate tools and techniques to gather, analyze, and interpret data
- Content Standard C - Reproduction and heredity; Regulation and behavior; Populations and ecosystems; Diversity and adaptations of organisms
- Content Standard F - Populations, resources, and environments

Materials

To be provided by the teacher:

- Research materials such as books, field guides, Internet access

To be photocopied from this guide:

- **Bird Identification** Field Journal Sheet (five per student)

Vocabulary

generated by student inquiry

Procedures

1. Introduction

Start by discussing the natural history of a bird that most students have seen (robin, raven, gull). Describe its size, physical characteristics, habitat, flight, voice, nest, eggs, and differences between males/females.

2. Distribute Field Journal Sheets

Hand out **Bird Identification** Field Journal Sheet (one per student) to explain that these characteristics apply to all birds. Break students up into at least five groups to represent the following species:

turkey vulture
Brewers blackbird
red-tailed hawk
acorn woodpecker
California quail

Research using various field guides, books, and the Internet will allow teams to fill in the worksheet. Each group should also locate or draw a picture of their bird. Explain to the students that each group will present its findings to the entire class.

3. Student Presentations

Distribute additional **Bird Identification** Field Journal Sheets prior to presentations (four per student). Have each group give a 5-minute presentation to the class on its bird species. While each group is giving its presentation, other students should record the information on their **Bird Identification** Field



Journal Sheets. The goal is for each student to have five **Bird Identification** Field Journal Sheets (one per bird species) to be included in their field journal.

4. Review

Following the completion of these presentations, discuss the concept of "niches". Compare and contrast the similarities and differences between the five bird species (feeding strategies, food sources, nesting locations, primary habitats). Emphasize that understanding these niches will assist students with field identification of these birds.

NOTE: All **Bird Identification** Field Journal Sheets will be incorporated into the students' field journal. Collect the sheets and hold until lesson "What Can We Expect on Our Field Trip to Observe Birds?" or ask the students to keep them someplace where they'll be able to locate the sheets again.

Extension Ideas

1. Introduce the concept of how birds receive their scientific name. Refer to the information below regarding the five species that were researched in this lesson.

Turkey vulture *Cathartes aura*
(*Cathartes* =Greek: "a purifier"; *aura* ="golden")

Red-tailed hawk *Buteo jamaicensis*
(*Buteo* =Latin "a hawk"; *jamaicensis* ="of jamaica": site of original specimen)

Acorn woodpecker *Melanerpes formicivorus*
(*Melanerpes* =Greek *melas* "black"+ Greek *herpes* "a creeper"; *formica*= Latin "an ant"+ Latin *vero* "devour")

Brewer's blackbird *Euphagus cyanocephalus*
(*Euphagus* = Greek *eu* "good" + Greek *phago* "to eat"; *cyanocephalus* =Greek *cyanos* "blue"+ Greek *cephale* "head")

California quail *Callipepla californica*
(*Callipepla* = Greek *kallos* "a beauty" + Greek *peplos* "a robe"; *californica*= the range)

(source: The Dictionary of American Bird Names, Ernest A. Choate)

Bird Identification



Field Journal Sheet

Below are listed categories that bird field guides often include in their descriptions of birds. Research the information for your group's bird and fill in the blanks. Use the back side of this paper to sketch your bird and label the distinguishing characteristics you might look for if you were bird watching in the field.

Common name:

Latin name:

Size:

Physical description: (Note differences between males and females)

Habitat:

Diet:

Flight:

Voice:

Nest:

Eggs:

Bird Identification



Teacher Information

Turkey vulture

(*Cathartes aura*)

Size:	26-32 inches
Description:	Black body, red head and legs. Immature birds have black or gray head. Large wing span, sometimes over 6 feet. In sky, note the two-tone black wings on underside. Females and males look alike.
Habitat:	Open areas in lowlands and mountains.
Diet:	Any dead animal from large to small.
Flight:	Soars with wings in a slight "v" shape. Rocks and tilts.
Voice:	Rarely heard hiss, grunts or growl.
Nest:	No nest. Will use caves or stumps. Sometimes loosely rakes together leaves, dirt, and wood chips.
Eggs:	2.8 inches, white

Red-tailed hawk

(*Buteo jamaicensis*)

Size:	19-25 inches
Description:	Large, stocky bird with dark brown back. Adults have light breasts in the summer and darken in the winter. Topside of tail is a bright orange-red in direct light. Immature birds have less coloration on the tail. Females and males look alike.
Habitat:	Open country and woodlands. Perch in plain sight in trees and on telephone poles and fences.
Diet:	Small mammals, birds, fish and reptiles
Flight:	Soars, hovers, and dives
Voice:	High pitched "keeeer-r-r"
Nest:	In high places with good views, made of large sticks and twigs, lined with bark, evergreen sprigs, and green leaves.
Eggs:	2.4 inches, white or bluish, sometimes with brown spots.

Acorn woodpecker

(*Melanerpes formicivorus*)

Size:	8.5-9.5 inches
Description:	Black back with white on the rump and white patches on the wings easily seen when flying. Head is topped with red with black surrounding the eyes and yellow or cream near the bill and throat. Male and female look similar. (Female has a black



bar between red and white on head; male's red crown meets the white directly.)

- Habitat:** Oak groves, mixed forest, oak and pine canyons, and foothills.
Diet: Eats acorns it collects and stores in the bark of trees. Also insects, fruit, sap, and corn.
Flight: Short spurts, often lands on fenceposts and trees.
Voice: "Whack-up, whack-up, whack-up" or "ja-cob, ja-cob."
Nest: Usually in a snag or on poles. Lined with wood chips.
Eggs: 1.0 inch, white

Brewer's blackbird
(*Euphagus cyanocephalus*)

- Size:** 9 inches
Description: Males: all black with iridescent sheen and yellow eye. Females: brownish gray with dark eye.
Habitat: Fields, prairies, farms, and parks.
Diet: Spiders, insects, crustaceans, snails, grass, and some seeds.
Flight: Short flights, found in flocks.
Voice: Song, creaking "ksh-ee," sometimes a short "chack"
Nests: Comprised of twigs, grass, mud, or cow dung, and lined with fine materials. Locations vary.
Eggs: 1.0 inch, gray with brown markings.

California quail
(*Callipepla californica*)

- Size:** 9.5-11 inches
Description: Small, plump, chicken-like bird with a short, curved black plume on the head. Male has black and white face and throat. Female: duller browns.
Habitat: Shrubs, woodland edges, coastal scrub, and farms.
Diet: Seeds, plants, acorns, fruit, insects, spiders, and snails.
Flight: Short and low to the ground.
Voice: Loud "chi-ca-go," also soft clucking.
Nest: Shallow, covered depression lined with leaves and grass.
Eggs: 1.2 inches, cream-colored with dull brown markings.

What Can We Expect on Our Field Trip to Observe Birds?



Pre-
Visit

Lesson Plan

Students will construct and review their personal field journals to prepare for upcoming field visit. Students should be comfortable with the types of information they will be responsible for collecting. This will allow the field trip to be focused on observation rather than instruction.

Time required: 1 hour

Location: classroom

Suggested group size: entire class

Subjects: science, math, writing

Concepts covered: bird identification and behaviors

Written by: Christie Denzel Anastasia, National Park Service

Last updated: 07/06/01

Student Outcome:

At the end of this activity, the students will be able to:

- Utilize field journals while viewing birds

California Science Standards Links (grades 6-8)

This activity is linked to the California Science Standards in the following areas:

- 6th grade 7a - select and use appropriate tools and technology to perform tests, collect data, and display data
 7h - identify changes in natural phenomena over time without manipulating the phenomena
- 7th grade 7a - select and use appropriate tools and technology to perform tests, collect data, and display data
- 8th grade 9b - evaluate the accuracy and reproducibility of data

National Science Standards Links (grades 5-8)

This activity is linked to the National Science Standards in the following areas:

- Content Standard A - Use appropriate tools and techniques to gather, analyze, and interpret data; Understanding about scientific inquiry



- Content Standard G - Science as a human endeavor; Nature of science: students formulate and test their explanations of nature using observation, experiments, and theoretical and mathematical models

Materials

To be photocopied from this guide:

- Field journals for each student, teacher, and chaperone
- Optional: Field Journal Sheets from on-site lesson **How Can I Capture My Experiences in a Story, Poem, or Drawing?**

Available for reservation at Bear Valley Visitor Center:

- Resident Birds Kit

Procedures

1. Preview Field Trip Logistics

See the on-site journal activity instructions for **What Is the Diversity of Birds Found at Point Reyes National Seashore?** This will give you an idea of what to expect on the day of the field visit.

2. Students Construct Their Field Journals

Hand out photocopies of the field journal sheets and have students assemble their field journals. Remember to include **Identifying Birds** (page 49) and **Bird Identification** (page 55) Field Journal Sheets from pre-visit lessons. Also, refer to the attached sheet for **Tips for Constructing Field Journals.**

3. Review Field Activities

Have students turn to appropriate page in their journal as you review expectations.

- **Things to Remember While on Resident Birds Field Trip**
This will be filled out after the next pre-visit lesson "Safety and Stewardship Challenge."
- **Code of Birding Ethics**
Review with students.
- **Watch Out for These Three Things**
Review with students.
- **Bear Valley Visitor Center Birds, Bird #1 and Bird #2**
Students will complete these field journal sheets for two taxidermy birds in the Bear Valley Visitor Center exhibit.
- **Habitat Key**
Students will use this map to locate the habitat where their field trip occurs.





- **Bird Observation Chart**

Students will use these sheets to record their bird sightings.

- **Layers of Forest Life**

Students will show where some of their bird observations occurred with respect to their location (in tree, under tree, on ground, etc.)

- **Site Map**

If birds are not found in relation to a forest, students may use this sheet to draw the general environment and where birds were found.

- **Evidence Hunt**

Students may observe signs of birds in addition to seeing birds. Students may place marks in each box indicating the number of times that they've seen a particular sign of birds.

- **Optional: How Can I Capture My Experiences in a Story, Poem, or Drawing?**

Students may choose one of the activities to complete while on their field trip.

4. Review What Students Should Bring on the Field Trip

Refer to chart in the Teacher Preparation section, page 4.

Tips for Creating Field Journals



Journal Tips

Materials

- ☐ Field Journal Sheets for each student, teacher, and chaperone
- ☐ One package blank paper and one package lined paper
- ☐ Colored paper, cardstock, or cardboard for journal covers
- ☐ Magic markers or colored pencils for decorating covers
- ☐ 3-hole punch
- ☐ String, binding tape, or twigs and rubber bands for binding
- ☐ Pencil on a string for each student
- ☐ Two plastic pencil sharpeners and extra pencils for field trip
- ☐ One box of large ziplock bags to rainproof journals

Procedures

1. Photocopy all of the unit handouts and provide each student with double-sided copies. Use recycled paper if it is available.
2. Provide five additional blank sheets of paper and five lined sheets of paper for each student.
3. Have students create front and back covers for their journals using blank sheets of paper.
4. Have students bind their journals using binding tape, hole punches and string, cardboard, or a twig bound by rubber bands threaded through holes.
5. Once journals are bound, have students decorate the covers.
6. Have each student attach a sharpened pencil on a long string through a hole in the journal binding.
7. Have each student use a magic marker to write their name on the front cover of their journal.
8. Students will need a sturdy writing surface behind their field journals. Incorporate cardboard as the last page or have clipboards available for each student.

Extension ideas

1. Create a journal that is used throughout the year.
2. Share student journals with parents at open houses.
3. Students may choose to use their journals to create a class newsletter, resource newspaper, or a class website.



Safety and Stewardship Challenge



Pre-
Visit

Lesson Plan

Students will learn methods for observing birds and understand proper behaviors in a National Park. This will be accomplished by simulating a group "game show" and completing the first page of their field journals.

Time required: 1 hour

Location: classroom

Suggested group size: any

Subject: science

Concepts covered: low impact use of natural areas, behaviors in a National Park, safety

Written by: Christie Denzel Anastasia and Lynne Dominy,
National Park Service

Last updated: 06/20/00

Student Outcomes

At the end of this activity, the students will be able to:

- List three safety precautions for upcoming field trip
- List three proper behaviors for bird watching
- Understand concepts of National Park System and stewardship

National Science Standards Links (grades 5-8)

This activity is linked to the National Science Standards in the following areas:

- Content Standard F - Personal Health: Injury Prevention; Populations, resources, and environment

Materials

To be provided by the teacher:

- Desk bell (or other device to indicate which team has the first answer)

To be photocopied from this guide:

- **Safety and Stewardship Challenge Questions** Teacher Information Sheet (one set)

Vocabulary

stewardship

Creating
**COASTAL
STEWARDSHIP**
through Science





Procedures

1. Divide Class into Teams.

Option A: If class can work as large teams, divide the class into two teams. Each team will need a spokesperson and team name. Answers will come from the entire group. Spokesperson can change throughout the game.

Option B: If class may get too loud, students can still be divided into teams, but answers will come from individuals on each team. One person from each team will be assigned a number. Team A and Team B will each have a #1, #2, etc. Randomly choose a number from hat. The student with that specific number from each team will be responsible for answering the question. Random choice of numbers will help students pay attention if they aren't quite sure when their turn will occur.

2. Draw Challenge Grid and Scorecard on blackboard.

There are four categories with questions of varying value. As a finale, there is a final challenge question. Draw this grid on the chalkboard:

Safety and Stewardship Challenge			
Category #1 Take Care of Yourself	Category #2 Minimize Your Impact	Category #3 Bird Watching Etiquette	Category #4 The National Park Service
1 point	1 point	1 point	1 point
2 points	2 points	2 points	2 points
3 points		3 points	
4 points	3 points	4 points	3 points
		5 points	
Final Challenge			

3. Choose Game Show Hosts.

Option A: Teacher is responsible for asking all of the questions.

Option B: Four students will become "Challenge Hosts". Each student receives questions for a specific category and will ask appropriate questions according to point value.



4. Rules of the Game

- A coin flip will determine which team goes first.
- The game will end when a predetermined time runs out or when all questions have been answered.
- Team will decide which category and value of question will be asked.
- Spokespersons or individuals will poise themselves on either side of the desk bell with one hand behind their backs.
- After the question is asked, the first team to have an answer will ring the bell and respond. If they are correct, the team receives the full point value.
- If they are incorrect, the other team gets a chance. If they also get it wrong, the first team can try again for one less point.
- When brainstorming answers, students should whisper, or the other team may hear their answer.
- When all of the categories are complete (or 5 minutes before a predetermined "game-over" time), class will go into "Final Challenge". Each team decides on amount of wager, listens to question, and writes down answer on a sheet of paper. Each team reveals answer.
- At the end of the game, the team with the most points "wins," but everyone wins if your visit to Point Reyes National Seashore will be safe for themselves and the resources.

5. Complete First Page of Field Journal.

Using the information gained in this "game show", have students list at least three items under each category on the first page of their journal (**Things to Remember While on Field Trip**). Use the **Safety Issues: Resident Birds** Teacher Information Sheet (page 73) as a guide.

Safety and Stewardship Challenge Questions



CATEGORY #1: Take Care of Yourself

1 point

Bring a water bottle and drink plenty of water because...

- A you will not be able to speak well with a dry throat.
- B not drinking enough water can give you a headache and cause you to make bad decisions.**
- C a heavy water bottle will slow you down as you are walking.
- D all of the above

2 points

If the sun feels warm, you should...

- A try to get a tan.
- B use sunglasses, sunscreen, and/or a hat.**
- C take off your shoes and walk barefoot.
- D all of the above

3 points

Cliff edges in Point Reyes National Seashore are...

- A made of granite and safe as long as you have one foot flat on the ground at all times.
- B sandy, loose, and slippery; be careful at all times.**
- C safe if you have good balance.
- D the best places for a good view.

4 points

The best way to dress for a field trip:

- A comfortable, closed-toe shoes.
- B a T-shirt and a heavy, waterproof jacket.
- C "like an onion," many thin layers with a waterproof one on the outside.**
- D A and C



Safety and Stewardship Challenge Questions

CATEGORY #2: Minimize Your Impact

1 point

When visiting Point Reyes National Seashore, you should stay on trails because...

- A you are more likely to pick up a tick in grassy areas.
- B when you travel off-trail you can damage plants.
- C you are speeding up erosion.
- D all of the above**

2 points

It's okay to take home just one rock from Point Reyes National Seashore:

- A Sure, it's just one, but let your teacher know.
- B No, every rock is home to many bugs and plants.
- C No, with 2.5 million visitors, the Seashore would be rock-less if every visitor collected just one.**
- D B and C

3 points

Trash is....

- A okay to hide behind bushes in a National Park because it will eventually break down.
- B not a good source of food for hungry animals.
- C not a part of the Point Reyes National Seashore ecosystem and should be properly disposed of whether it's your trash, or trash that someone else accidentally dropped.**
- D only the responsibility of the maintenance staff, wherever it is.

Safety and Stewardship Challenge Questions



Teacher Information

CATEGORY #3: Bird Etiquette

1 point

To identify birds, you would use...

- A a bird field guide.
- B a dictionary.
- C an experienced bird watcher.
- D a and c**

2 points

If you find a nest with eggs in it, it's appropriate to...

- A collect the eggs and take them home to hatch.
- B pick them up to examine and identify them.
- C move away slowly and quietly, leaving them alone.**
- D stay close and wait for the parents to return.

3 points

The best way to see a bird up close is to...

- A sit quietly and use binoculars or a spotting scope.**
- B leave the bird some crumbs from your lunch.
- C sneak up on it.
- D call the bird to come to you.

4 points

Feeding birds is harmful to them because...

- A it changes their natural behavior.
- B it makes it easier for the neighborhood cats to catch and kill them.
- C it can create a dependency on humans to provide their food.
- D all of the above**

5 points

If you come across a bird appearing sick or injured, you should:

- A try to capture the bird and seek medical attention.
- B leave the bird where it is but report the location, species, and your observations to someone who may be able to help (Park Rangers in National Parks, wildlife or "wildcare" rehabilitation facility in other areas).**
- C take it home to care for it.
- D get as close as possible to observe what is happening.



Safety and Stewardship Challenge Questions

CATEGORY #4: The National Park Service

1 point

Which of the following is not in the National Park Service?

- A Grand Canyon National Park, AZ
- B Keweenaw National Historical Park, MI
- C Monterey Bay Aquarium, CA**
- D Golden Gate National Recreation Area, CA
- E Yosemite National Park, CA

2 points

You should treat Point Reyes National Seashore with respect because...

- A it belongs to everyone in the entire United States.
- B it preserves a part of the ecosystem you live in and depend on.
- C it's one of the few places natural processes can happen with little intervention from human society.
- D all of the above**

3 points

Which of the following is the mission of the National Park Service?

- A Preserve natural and cultural resources.
- B Provide for the enjoyment, education, and inspiration of this generation.
- C To care for special places saved by the American people so that all may experience our heritage.
- D Cooperate with other resource-conservation and outdoor-recreation organizations in our country and the world.
- E all of the above**

Bonus for one additional point:

Is the mission of the National Park Service a law?

Yes. The 1916 Organic Act mandates the National Park Service to preserve and protect the natural and cultural heritage of the United States for the enjoyment of its citizens, leaving them unimpaired for the enjoyment of future generations.

FINAL CHALLENGE

This question is worth the amount that each team agrees to wager.

What does stewardship mean?
Teacher is the final judge on this answer.

Safety Issues: Identifying Resident Birds



Personal Safety

- Watch where you are walking; the ground may be rocky and uneven.
- Stay with your group.
- Drink plenty of water to avoid dehydration.
- Protect yourself from the sun's rays; use sunscreen and/or a hat.
- Stay on paths and in picnic area. Grassy areas may have ticks known to transmit Lyme disease.
- Be aware of personal allergies or conditions that may cause concern on the trail.

Bird Viewing Tips

- Always observe birds from a distance.
- Remember, if you point at birds, they may fly away.
- Use binoculars and spotting scopes.
- Watch quietly, whisper. Move slowly or birds may fly away.
- Keep away from nests, nesting colonies, and important feeding areas.

Remember... You are in a part of the National Park System

- Point Reyes National Seashore is a natural area set aside to protect living and nonliving components of an ecosystem. Treat everything with respect.
- Allow plants and rocks and everything to continue their existence as part of an ecosystem by leaving things as they are found.
- Stay on established trails.
- Pack out trash or use garbage cans.

How Do I Use Binoculars?



Pre-
Visit

Lesson Plan

Students prepare for upcoming resident birds field trip by becoming familiar with binocular structure and use. The key to bird watching is being able to locate the the bird first without binoculars, and then to quickly relocate the bird again with binoculars.

Time required: varies

Location: in class and/or sections at Bear Valley Visitor Center

Suggested group size: entire class

Subject: physics

Concepts covered: binocular structure and use

Written by: Christie Denzel Anastasia, National Park Service

Last updated: 09/31/00

Student Outcomes

At the end of this activity, the students will be able to:

- Understand the structure of binoculars
- Practice focusing on moving images with binoculars

California Science Standard Links (grades 6-8)

This activity is linked to the California Science Standards in the following areas:

- 6th grade 7b - appropriate tools/technology to perform tests, collect/display data
- 7th grade 6b - to see an object, light emitted/scattered must enter eyes
6d - simple lenses used in optics
7a - appropriate tools/technology to perform tests, collect/display data

National Science Standard Links (grades 5-8)

This activity is linked to the National Science Standards in the following areas:

- Content Standard A - Abilities necessary to do scientific inquiry: Use appropriate tools and techniques to gather, analyze, and interpret data.

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Materials

To be provided by the teacher:

- Resident Birds Kit and 20-40 pairs of binoculars (available for checkout at Bear Valley Visitor Center)

Procedures

Note: This lesson can be done in various stages depending on whether or not students have access to binoculars in class.

If students can **bring in a pair** of binoculars to use in class:
this entire lesson can be conducted in class.

If students can **share a pair** of binoculars to use in class:
Procedures 1 and 2 can be taught to entire class. Student teams can experiment with binoculars in 10-minute intervals throughout day.

If students **do not have access** to binoculars:
Procedures 1 and 2 can be conducted in class, Procedure 3 at Bear Valley Visitor Center when students receive individual binoculars from the Resident Birds Kit.

1. How Do Binoculars Work?

In Theory: Before prisms were available, lens barrels had to be very long to increase the distance between eyepiece lens and objective lens to achieve magnification. These are the traditional "pirate scopes." With the introduction of prisms, the light was bent and barrels made shorter. Binocular vision allows two images to become one for depth perception. Monoculars are like binoculars, but made for one eye and provide no depth perception.

In Structure: There are four main components of binoculars. Power is a function of these components. A 6x30 binocular has 6x magnification and a 30-millimeter lens. A larger lens lets in more light.

Eyepiece Lens: There are several convex lenses here for magnification. This is the lens closest to your eye.

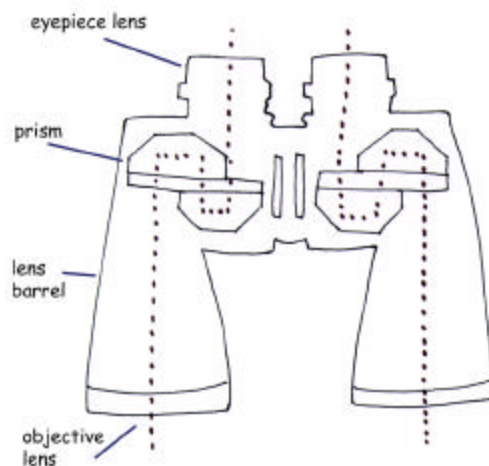
Prism: Bends light rays and returns reverse image to normal.

Lens Barrel: Keeps distance between eyepiece lens and objective lens. Blocks side lighting and protects from dirt.

Objective Lens: Gathers light in a convex lens. This is the lens that has a millimeter measurement (i.e., 6x30).



Diagram of Binocular Design



2. How Do I Get Binoculars to Work Specifically for Me?

Taking care of binoculars:

- Always keep them attached around your neck so they aren't accidentally dropped.
- While you are focusing binoculars, stand still. It would be easy to fall while focusing and walking.
- Clean binoculars properly.

If you wear eyeglasses:

- Keep your eyeglasses on.
- There is usually an "eye cup" rubber piece that folds back where your eyeglasses meet the eyepiece lens.

Things you adjust once:

- Barrel distance: The two barrels can be moved closer or further apart depending on the distance between your eyes.
- Focus right eyepiece: There is a knob on the right eyepiece that corrects for visual differences between your two eyes. If you are seeing more than one image, adjust the right eyepiece until there is one image.

Things you need to adjust with each observation:

- Center focus: Adjust the center focus with each observation to bring image into view.

Focusing on an image:

- Adjust barrel distance and right eyepiece
- Locate the image with your eyes. Are there any landmarks or reference points next to the image? These may help you find the image using the binoculars.
- Focus your eyes on the image. Without looking down, place the binoculars directly in front of your eyes. The rubber cup surrounding the eyepiece lens should rest against your eyebrow (unless you are wearing eyeglasses).
- Focus image into view with center focus. Keep elbows tucked in close to your body and both hands on binoculars to avoid a shaky image.



3. Practice Using Binoculars

Focus on a stationary object.

- Pick an object that doesn't move. Choose one somewhat near and one somewhat far. Use center focus.

Focus on moving objects in class.

- Right/left: Have a student walk slowly across the classroom while students use binoculars to keep in view. Speed up student walker to add a challenge.
- Away/toward: Choose a student to move toward and away from binoculars. Discuss range at which binoculars will work. At some point, object is too close to focus.

Focus on multiple moving objects at school.

- Attend a sporting event or practice at a lunch session in the cafeteria.
- Place a wildlife poster on a piece of cardboard and stick. Have a student move around the classroom with the posterboard: slow, fast, up, down, toward, away.

Focus on wildlife.

- Bring class outside in an area where they are likely to view moving wildlife such as birds.



Identifying Resident Birds

On-Site Activities

What Is the Diversity of Birds Found at Point Reyes National Seashore?	81
How Can I Capture My Experiences in a Story, Poem, or Drawing?	101
How Can I Participate in Bird Banding at Point Reyes Bird Observatory?	105
How Can We Inspire Others to Protect Birds and Their Habitat?	109

What Is the Diversity of Birds Found at Point Reyes National Seashore?



On-site Lesson Plan

Students will observe birds found within Point Reyes National Seashore and use a variety of clues to identify specific individuals. Field notes recorded by students will also include habitat information for a clearer understanding of bird ecology. This link between birds and their habitats will be further explored back in class with the first post-visit lesson.

Time required: 2 hours

Location: Bear Valley Visitor Center and select trails

Suggested group size: small groups of 5 or 6 students each

Subject: ornithology

Concept covered: bird identification

Written by: Lynda Doucette and Daisy Martin, National Park Service

Last updated: 07/06/01

Student Outcomes

At the end of this activity, the students will be able to:

- Identify one or two of the birds in the Bear Valley Visitor Center exhibit
- Identify common birds of Point Reyes National Seashore and their specific behaviors and habitats

California Science Standards Links (grades 6-8)

This activity is linked to the California Science Standards in the following areas:

- 6th grade
- 5a - energy entering into ecosystems as sunlight is transferred by producers into chemical energy through photosynthesis, and then from organism to organism in food webs
 - 5b - organisms and the physical environment
 - 5e - the number and types of organisms an ecosystem can support depend on the resources available and abiotic





factors, such as quantity of light and water, range of temperatures, and soil composition

7b - appropriate tools and technology to perform tests, collect and display data

7th grade 5a - the anatomy and physiology of plants and animals illustrate the complementary nature of structure and function.

7a - appropriate tools and technology to perform tests, collect and display data

National Science Standards Links (grades 5-8)

This activity is linked to the National Science Standards in the following areas:

- Content Standard A - Use appropriate tools to gather, analyze, and interpret data; Think critically and logically to make the relationships between evidence and explanations
- Content Standard C - Structure and function in living systems; Diversity and adaptation of organisms

Materials

To be provided by the teacher:

- Pencils
- Clipboards
- Field Journals for each student, teacher, and chaperone

Available for checkout at Bear Valley Visitor Center:

- Residents Bird Kit

Vocabulary

crown, habitat, mandible

Procedures

Note: This field trip consists of two parts: a visit to the Bear Valley Visitor Center and activities on a nearby trail.

Bear Valley Visitor Center Activity

1. Orientation

The Visitor Center has running water and restrooms available and this is the place to pick up your reserved Resident Bird Kit at the desk. Instruct students to use their "library voices" while inside Visitor Center. Explain that the Visitor Center is divided into habitats found in the Park with their corresponding plants and animals.



Note: This is a great opportunity to purchase the *Field Checklist of Birds for Point Reyes National Seashore* at the Bear Valley Visitor Center bookstore. It will be useful for your time at the Seashore and for the post-visit lesson for this activity.

2. Describe Activity

Students will form smaller groups and locate a taxidermy bird in the exhibits. As a group, they will answer the questions found on the **Bear Valley Visitor Center Birds** Field Journal Sheet. Each group will be responsible for locating and answering questions for two birds in the exhibit.

When students are finished answering the questions, they may borrow a bird identification book from the information desk to discover the names of the bird.

3. Review

Teachers or chaperones should borrow a bird identification guide from a park ranger (there are some located behind the information desk). Walk through the exhibit with the entire group. Ask students to identify birds based on answers from their sheets. Note the specific habitat for each bird. Point out the bird and the bird illustrations in the book. Ask students to relate the easiest way to remember particular birds (i.e., turkey vultures have red heads.)

Field Observation Activity

4. Locate Trail

Ask a Park Ranger for specific directions to one of the following trails:

Woodpecker Trail

Horse Trail (lower area of trail)

Bear Valley Trail

Kule Loklo Trail

Rift Zone Trail

(if at Clem Miller Education Center, consult with Director)

5. Form Student/Chaperone Groups

Form smaller groups with chaperones and students. Decide if the entire class will be strung out along one trail, or if smaller groups will use different trails and meet back at the bus at a specific time. Review the first sheet of the field journal **Things to Remember While on Resident Bird Field Trip** for safety precautions.

6. Hike Trail

As students hike the trail, instruct them to be on the lookout for birds or signs of birds. Students will complete pages of their field journal based on these observations.

7. Regroup and Return Home

Return the Bird Kit to the Bear Valley Visitor Center before 5:00 p.m. when the center closes.



Things to Remember While on Resident Birds Field Trip

Three safety precautions:

1.

2.

3.

Four resource protection behaviors:

1.

2.

3.

4.

If I were a bird, I would want...

1.

2.

3.



Code of Birding Ethics

Everyone who enjoys birds and birding must always respect wildlife, its environment, and the rights of others. In any conflict of interest between birds and birders, the welfare of the birds and their environment come first.

- Promote the welfare of birds and their environment.
- Support the protection of important bird habitat.
- To avoid stressing birds or exposing them to danger, exercise restraint and caution during observation or photography.
- Keep well back from nests and nesting colonies, roosts, display areas, and important feeding areas.
- Stay on roads, trails, and paths where they exist; otherwise keep habitat disturbance to a minimum.
- Respect the law and the rights of others.
- Do not enter private property without the owner's explicit permission.
- Ensure that feeders, nest structures, and other artificial bird environments are safe.
- Keep dispensers, water, and food clean and free of decay or disease.
- Maintain and clean nest structures regularly.
- If you are attracting birds to an area, ensure the birds are not exposed to predation from cats, and other domestic animals, or dangers posed by artificial hazards.
- Group birding, whether organized or impromptu, requires special care.
- Keep groups to a size that limits impact on the environment and does not interfere with others using the same area.

Courtesy of American Birding Association



Watch Out for These Three Things...

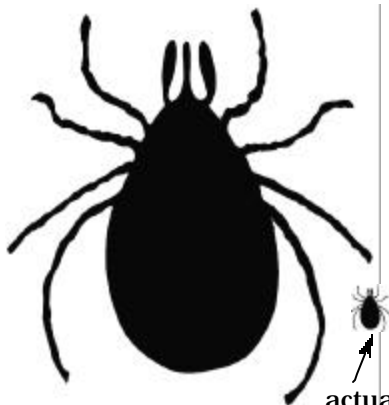
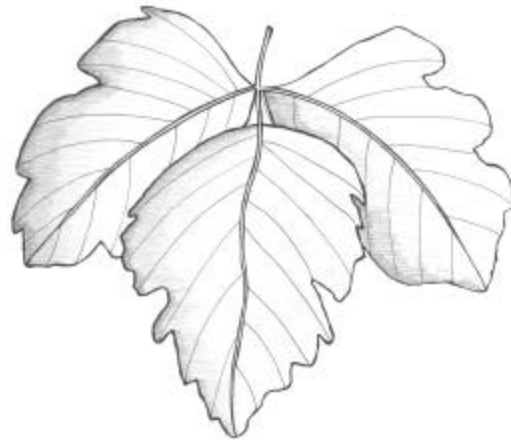


Stinging nettle

Stinging nettle is a tall plant with needlelike hairs, which can create a burning or stinging sensation for up to 24 hours. If you see this plant, do not touch it.

Poison oak

Poison oak has three smooth, shiny leaflets which are bright green or reddish. It can grow up trees as a vine, as a small bush, or as a small ground cover plant. Poison oak causes an itchy, blistering irritation which can last for one to two weeks. Even when leaves are not present, it is possible to get poison oak. Wash all skin and clothing that may have come in contact with poison oak with cool water and a grease-cutting soap.



Ticks

Ticks carrying Lyme disease are found at Point Reyes National Seashore. Check your body after a hike. Wear light colored long pants and shirts to help find ticks. Tuck your pant legs into your socks.

actual size



Field Journal Sheet

Bear Valley Visitor Center Birds

Physical descriptions of birds are included in bird-watching field guides and often help observers identify birds they do not know by describing their appearance in detail. To practice looking for the unique traits found in each bird, you will choose a mounted bird in the Bear Valley Visitor Center display and write down your observations on this worksheet.

BIRD #1

Face: Describe the characteristics of the face (colors, mask, whiskers, eye ring, eye brow)

BIRD #1

Throat: What colors are present on the throat? What is the pattern of feathers (stripes, spots, solid)?

BIRD #1

Belly: What is the color of the belly? How does it change from top to bottom?

BIRD #1

Mandible: Describe the beak in detail (shape, color, flat etc.).

BIRD #1

Crown: Describe the top of the bird's head. Does it have a different pattern from the body?



Field Journal Sheet

BIRD #1

Back: Are the back feathers one color or many? Describe the plumage.

BIRD #1

Wing: Do you see a pattern of colors on the wing? Describe the colors and location on the wing.

BIRD #1

Rump: Is the rump a different color compared to the back or wings? Describe the colors.

BIRD #1

Tail: How is the color of the tail different from the front and back of the bird? Are the tail feathers pointed or blunt-tipped?

BIRD #1

Using a field guide from the information desk, identify your bird:

Common name:

Scientific name:

Preferred habitat:



Field Journal Sheet

Bear Valley Visitor Center Birds

Physical descriptions of birds are included in bird-watching field guides and often help observers identify birds they do not know by describing their appearance in detail. To practice looking for the unique traits found in each bird, you will choose a mounted bird in the Bear Valley Visitor Center display and write down your observations on this worksheet.

BIRD #2

Face: Describe the characteristics of the face (colors, mask, whiskers, eye ring, eye brow)

BIRD #2

Throat: What colors are present on the throat? What is the pattern of feathers (stripes, spots, solid)?

BIRD #2

Belly: What is the color of the belly? How does it change from top to bottom?

BIRD #2

Mandible: Describe the beak in detail (shape, color, flat etc.).

BIRD #2

Crown: Describe the top of the bird's head. Does it have a different pattern from the body?



Field Journal Sheet

BIRD #2

Back: Are the back feathers one color or many? Describe the plumage.

BIRD #2

Wing: Do you see a pattern of colors on the wing? Describe the colors and location on the wing.

BIRD #2

Rump: Is the rump a different color compared to the back or wings? Describe the colors.

BIRD #2

Tail: How is the color of the tail different from the front and back of the bird? Are the tail feathers pointed or blunt-tipped?

BIRD #2

Using a field guide from the information desk, identify your bird:

Common name:

Scientific name:

Preferred habitat:



Habitat Key

Use the information in the chart below to see if you can determine in which habitat you are presently located. When you have made your best decision based on your observations, circle the name of the habitat.

	Coastal Scrub	Riparian	Mixed Woodland	Estuary	Beach/Dunes	Tidepools
Soil Moisture	DRY less than 28 inches rain/year	VERY WET (usually year- round)	MOIST to DRY receives up to 40 inches rain/year	VERY WET influenced by tides	VERY DRY	No soil; rocky foundation
Soil Characteristics	Hard, solid	Muddy	Loose soil with decaying plants	Muddy, salty	Loose, sandy	Underwater
Weather/Winds	Receives high winds and summer fog	Floods; heavily influenced by rain and runoff	Trees provide shelter from weather	Influenced by floods, coastal storms, and tides	Influenced by coastal storms and tides	Influenced by coastal storms and tides
Exposure	Fully exposed	Often shaded by fast-growing trees	Heavily shaded by large trees and thick understory	Only exposed during low tides	Fully exposed; windswept	Only exposed during low tides
Terrain	Flat or hilly; along western side of Inverness Ridge and near ocean	Along creeks and drainages	Along Inverness Ridge and its eastern slope	Flat tidal zones	Gently sloping from ocean to dunes	Flat and rocky
Dominant Plants	coyote bush bush lupine cow parsnip hemlock yarrow	red alder stinging nettle bracken fern blackberry horsetail	coast live oak Douglas fir tree California bay elderberry poison oak	eelgrass	dune grass dune lupine beach strawberry saltbush	sea lettuce eelgrass Turkish towel kelp
Common Wildlife	black-tailed deer coyote garter snake cottontail rabbit turkey vulture California quail	raccoon Pacific tree frog coho salmon steelhead trout banana slug rough-skinned newt	black-tailed deer pocket gopher acom woodpecker turkey vulture California quail banana slug	great blue heron northern harrier duck osprey harbor seal bat ray	willet marbled godwit harbor seal snowy plover western gull mole crab	anemone chiton sea star kelp crab barnacle mussel



Field Journal Sheet

Bird Observation Chart				
Your name:				
Temperature:				
Estimated cloud cover:				
Estimated wind speed:				
LOCATION: tree, bush, ground, sky, etc.	PHYSICAL DESCRIPTION: describe main features	BEHAVIOR: foraging, preening, flying, flocking, perching, displaying, calling, singing, courtship	COUNT: individual or group	SKETCH OF BIRD:



Field Journal Sheet

Bird Observation Chart

Your name:

Temperature:

Estimated cloud cover:

Estimated wind speed:

LOCATION: tree, bush, ground, sky, etc.	PHYSICAL DESCRIPTION: describe main features	BEHAVIOR: foraging, preening, flying, flocking, perching, displaying, calling, singing, courtship	COUNT: individual or group	SKETCH OF BIRD:



Field Journal Sheet

Bird Observation Chart				
Your name:				
Temperature:				
Estimated cloud cover:				
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LOCATION: tree, bush, ground, sky, etc.	PHYSICAL DESCRIPTION: describe main features	BEHAVIOR: foraging, preening, flying, flocking, perching, displaying, calling, singing, courtship	COUNT: individual or group	SKETCH OF BIRD:



Field Journal Sheet

Bird Observation Chart

Your name:

Temperature:

Estimated cloud cover:

Estimated wind speed:

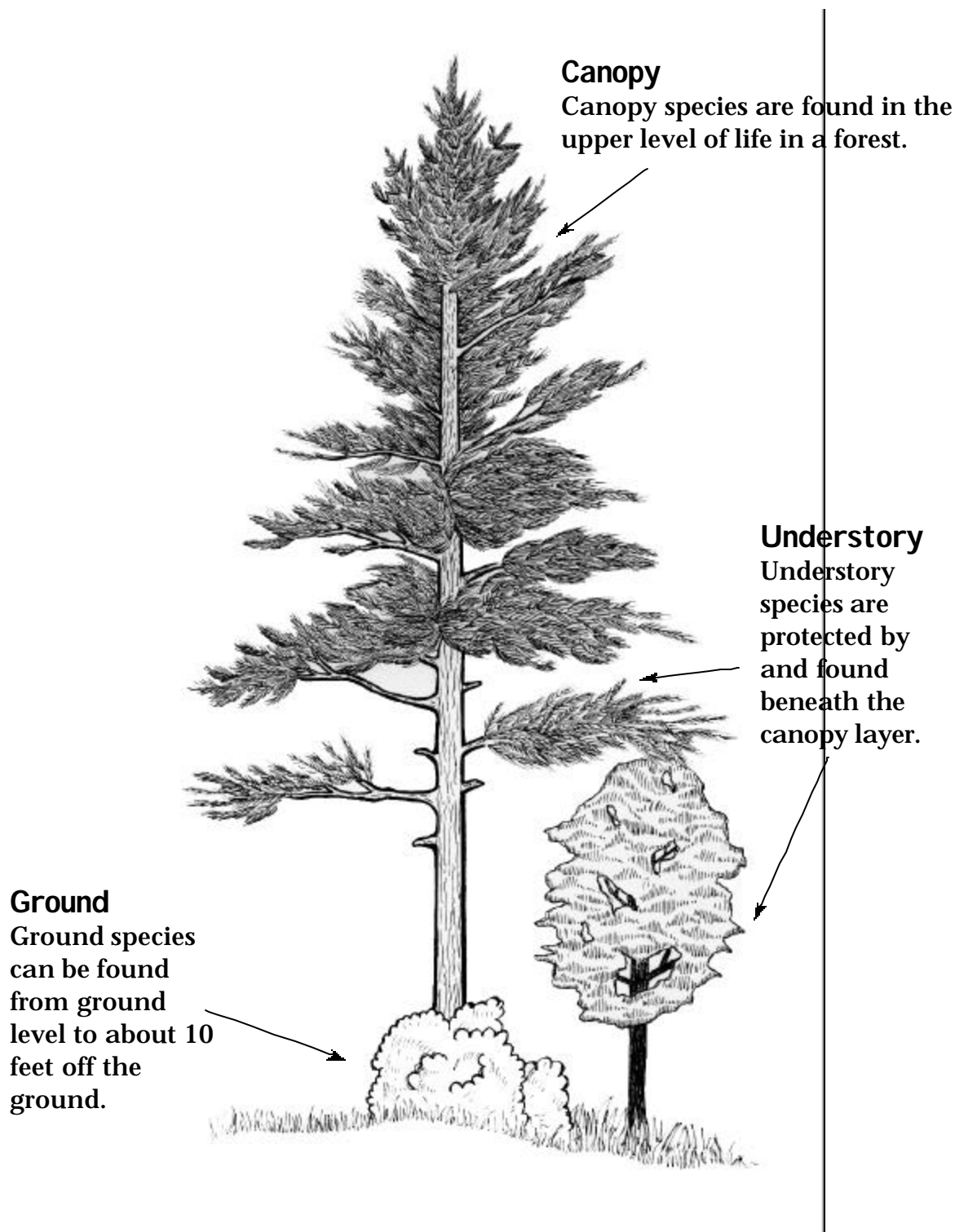
LOCATION: tree, bush, ground, sky, etc.	PHYSICAL DESCRIPTION: describe main features	BEHAVIOR: foraging, preening, flying, flocking, perching, displaying, calling, singing, courtship	COUNT: individual or group	SKETCH OF BIRD:

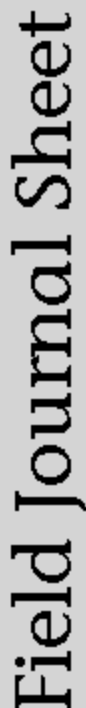


Layers of Forest Life

Where are you seeing birds?

Spend 10 minutes sitting quietly looking and listening for birds. Mark the area where you believe the birds are located according to the picture below. If you can identify the birds, add their names.





Use the area below to sketch where you found at least one bird from a “bird’s-eye-view.” Include any areas of water, hiking trails, downed trees, people, or other items in the landscape.

This image shows a full page of blank graph paper. The grid consists of thin, light gray horizontal and vertical lines that intersect to form small squares across the entire surface. There are no margins, text, or other markings on the paper.



Field Journal Sheet

Evidence Hunt

Sometimes you are not able to see birds when you go bird watching. However, if you look and listen carefully, you will find evidence of birds all around you. Keep track of the different types of bird evidence you encounter during your bird watching expedition. Mark off how many times you encounter each piece of evidence in the appropriate box below.

Eggs or Egg Shells	Holes in Trees	Feathers	Sound of Flight
Bones	Interested Cat or Other Predator	Carcass Picked Clean	Tapping or Scratching Sounds
Partial Insects or Animals	Acorns in Trees	Your Choice! Name it:	Pellets
Scat or Droppings	Song or Call	Half-Eaten Berries	Nest or Nest Materials
Bird Footprints	Clucking or Cooing	Branch or Twig Moving	Empty Seed Husks

How Can I Capture My Experiences in a Story, Poem, or Drawing?



On-site Lesson Plan

Students will use their experience bird-watching to create a story, poem, or drawing. Drafts or sketches may be made in their field journals and final writings or drawings completed in class. Students or teachers are able to choose which activities will be completed.

Time required: ½ hour

Location: on-site/classroom/homework

Suggested group size: entire class

Subjects: creative writing; science, language arts

Concepts covered: poetry; creative writing

Written by: Melinda Repko, National Park Service

Last updated: 12/08/00

Student Outcomes

At the end of this activity, the students will be able to:

- Reflect on their experiences by sharing a poem, story, or drawing
- Make emotional connections to the resources

Materials:

To be supplied by teacher:

- Extra paper to be included in field journal

To be photocopied from this guide:

- **How Can I Capture My Experiences in a Story, Poem, or Drawing?** Field Journal Sheet

Procedures

1. Include a copy of the **How Can I Capture My Experience in a Story, Poem, or Drawing?** Activity Sheet in each student's journal.
2. Either choose an activity for students to complete or have students decide which they would like to complete.
3. Allow at least one-half hour to complete this activity in the field. Students may refine their work once back in class.

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Extension Ideas

1. Have students complete a variety of the activities, creating a booklet of their creative work.
2. Using canvas material and tempera paint, have students create a mural of their experiences bird-watching in Point Reyes National Seashore.



How Can I Capture My Experiences in a Story, Poem, or Drawing?

Choose one of the following activities. Use blank paper in your field journal to complete your work.

1. Create a Haiku

A three-line poem originating in Japan based on syllables - not rhyming.

Line 1: five syllables
Line 2: seven syllables
Line 3: five syllables

2. Create a Diamante

This five-line poem is displayed in the shape of a diamond.

Line 1: noun
Line 2: adjective adjective
Line 3: participle participle participle participle
Line 4: noun noun noun noun
Line 5: noun

3. Freestyle Poem

A poem can rhyme or not rhyme. It can be many words or few. The only limitation is your imagination!

4. Create an Outline-Creation

Draw the outline of a bird in pencil. Use the outline as a guide to write your words on...OR use the outline as a guide to write your words in.

Use words or sentences that describe its characteristics. Hint: if you draw in pencil and write in pen, you can carefully erase the pencil when the ink dries.

5. Create a Comic Strip

Think about the different events that took place while you were looking for birds. Create a comic strip depicting one of these events. Don't forget to give your comic strip a title.

How Can I Participate in Bird Banding at Point Reyes Bird Observatory?



On-site Lesson Plan

The Point Reyes Bird Observatory is one of the premier long-term ornithological research facilities in the western United States. A class visit will allow your students to observe ongoing research first hand.

Time required: 1 to 2 hours

Location: Point Reyes Bird Observatory

Suggested group size: entire class

Subjects: science and research

Concepts covered: bird banding and netting

Written by: Melissa Pitkin, Point Reyes Bird Observatory

Last updated: 07/07/01

Student Outcomes

At the end of this activity, the students will be able to:

- Understand the significance of bird research
- Explain how bird banding is done

National Science Standards Links (grades 5-8)

This activity is linked to the National Science Standards in the following areas:

- Content Standard A - Understanding about scientific inquiry
- Content Standard C - Populations and ecosystems
- Content Standard G - Nature of science

Procedures

1. Review the following Teacher Information sheet to decide if a visit to Point Reyes Bird Observatory is an option for your class.

Extension Ideas

1. Consider visiting The Golden Gate Raptor Observatory at the Marin Headlands. Every autumn, thousands of migrating birds of prey appear over the Golden Gate near San Francisco. For more information call (415) 331-0730 or visit www.ggro.org.

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Visiting Point Reyes Bird Observatory



Field Journal Sheet

Description:

Point Reyes Bird Observatory's Palomarin Field Station, located near the end of Mesa Road, north of the town of Bolinas in western Marin County, is one of the premier long-term ornithological research facilities in the western United States. Throughout the year we open our mist nets (fine mesh nylon nets) during the morning hours to capture wild songbirds which are brought into our banding lab for banding and measurement, and then released unharmed a few minutes later. What makes Palomarin truly unique is its accessibility and open-door policy for the public. This is one of the few places in the country where members of the general public, school classes and groups of all ages can observe an ongoing research program firsthand, learning from the biologists and professional interpreters about birds and the nature of conservation biology research. Visitors are invited to accompany the biologists on a short loop trail as they check the nets and extract captured birds, and may then observe procedures in the banding lab. This opportunity to see living warblers, finches, sparrows, jays, and other species at extreme close range while learning about their anatomy, physiology, ecology, and identification from professionals is a very special experience. It can also be an extremely powerful tool for building an interest in and an appreciation of birds, wildlife conservation, and the biological sciences in general.

When:

The optimum time of year to visit the Field Station, for weather and number of birds, is between the months of April and October; winter visits are possible by special arrangement.

How:

Drop-in visitors (groups of seven or fewer) are always welcome but may wish to call to check on current conditions. Larger groups should schedule a tour ahead of time. Nets are closed, sometimes on short notice, by rain, heavy fog, or strong winds. To schedule a tour or check weather conditions call the Education Specialist at (415) 868-0655.

Visit www.prbo.org to learn more about the Point Reyes Bird Observatory.

How Can We Inspire Others to Protect Birds and Their Habitat?



On-site Lesson Plan

Students will videotape birds during their field trip, and use the video to foster stewardship with elementary classes or via local programming.

Time required: 15 minutes on field visit, various amounts of time depending on strategy

Location: Point Reyes National Seashore/ classroom

Suggested group size: small groups

Subject: language arts

Concept covered: stewardship education

Written by: Trudie Behr-Scott, Novato School District

Last updated: 03/2/00

Student Outcomes

At the end of this activity, the students will be able to:

- Formalize a presentation on birds

National Science Standards Links (grades 5-8)

This activity is linked to the National Science Standards in the following areas:

- Content Standard F - Populations, resources, and environments: Causes of environmental degradation and resource depletion vary from region to region and from country to country; Risks and benefits: Important personal and social decisions are made based on perceptions of benefits and risks

Materials

To be provided by the teacher:

- Camcorder with tape and charged battery to be used on visit

Vocabulary

stewardship





Procedures

1. Research local public access channels. Most are required to show 20 minutes/month local programming. OR identify other elementary classes that would be interested in viewing a presentation on birds created by your class.
2. Secure camcorder/tape for day of field visit. One adult chaperone could rotate the camcorder to each of the groups for 5-10 minutes of videotaping. (If you have access to editing equipment, students may tape longer segments).
3. Back at school, have students create a dialogue (to be superimposed on video images) discussing some of the following points.

Why is Point Reyes National Seashore a good place to see birds?

What are some threats to birds and their habitat?

What can we do to protect birds?

What was the most enjoyable aspect of viewing birds?

What do we mean by stewardship?

What have we done already to help birds?

What would we like to be able to do in the future?

Extension Ideas

1. When have videotaped images in the past been used to persuade populations? (W.W.II, Echo Park Dam Controversy at Dinosaur National Monument, commercials, television)



Identifying Resident Birds

Post-Visit Activities

What Can We Learn From Our Field Journals? 113

How Can I Choose and Complete the Best
Stewardship Project?117

What Can We Learn From Our Field Journals?



Students compile data from field journals to draw conclusions between what they have learned in class and what they have experienced in the field.

Time required: 2 hours

Location: classroom

Suggested group size: entire class

Subjects: science, language arts, math

Concepts covered: science, math

Written by: Christie Denzel Anastasia, National Park Service

Last updated: 07/08/01

Student Outcomes

At the end of this activity, the students will be able to:

- Understand the significance of scientific observations
- Understand the relationship between birds and their habitat

California Science Standards Links (grades 6-8)

This activity is linked to the California Science Standards in the following areas:

- 6th grade
- 5e - the numbers and types of organisms an ecosystem can support depend on the resources available and abiotic factors, such as the quantity of light and water, range of temperatures, and soil composition
 - 7b - appropriate tools and technology to perform tests, collect and display data
 - 7d - communicate the steps and results from an investigation in written reports and verbal presentations
 - 7e - recognize whether evidence is consistent with a proposed explanation
- 7th grade
- 7a - appropriate tools and technology to perform tests, collect and display data
 - 7b - utilize a variety of print and electronic resources (including the World Wide Web) to collect information as evidence as part of a research project



7c - communicate the logical connections among hypotheses, science concepts, tests conducted, data collected, and conclusions drawn from scientific evidence

8th grade 9b - evaluate the accuracy and reproducibility of data

National Science Standards Links (grades 5-8)

This activity is linked to the National Science Standards in the following areas:

- Content Standard A - Use appropriate tools and techniques to gather, analyze, and interpret data; Think critically and logically to make the relationship between evidence and explanations; Recognize and analyze alternative explanations and predictions; Communicate scientific procedures and explanations; Use mathematics in all aspects of scientific inquiry; Understanding about science and technology
- Content Standard C - Populations and ecosystems

Materials

To be provided by the teacher:

- Eight large sheets of paper, markers
- *Field Checklist of Birds for Point Reyes National Seashore* (available at the Bear Valley Visitor Center bookstore)

Procedures

1. Review Field Trip

Each student should have his or her completed field journals for this lesson. Ask students about their experiences birding. What was the easiest thing about birding? What was the most difficult? Explain that being able to identify a bird is only part of the story. It is important to understand the bird's behaviors, habits, and significance in the ecology of an area. It's also important to understand challenges facing a bird and its habitat in its ability to survive.

2. Review Bird Observation Charts

If students were able to identify specific birds on their field trip:

Use the *Field Checklist of Birds for Point Reyes National Seashore* to differentiate between resident species and migratory species. Refer to the charts found in the *Birds of Point Reyes National Seashore* newspaper. Did the observed species coincide with land or ocean habitat? Season? Location? Using a bird identification guide, map the routes of the migratory species.

If students were able to identify only resident birds studied previously:

If students observed any of the following species, divide the class into groups to research more of the natural history specific to that bird (turkey vulture, red-tailed hawk, acorn woodpecker, Brewer's blackbird, California quail).

Encourage information related to ecology, habitat, and threats to bird and/or habitat.



3. Summary

Encourage students to share what they have learned from their field journals and this lesson. Students could draw a poster summarizing their field trip or write stories about what happened while they were bird-watching. Additional activities in the post-visit lesson **How Do I Choose and Complete the Best Stewardship Project?** will relate birds and their lives to the choices we make.

Extension Ideas

1. Expand the class research to include a broader range of bird species that live or pass through Point Reyes. Have the students build a model of the habitats of Point Reyes National Seashore and create a comprehensive presentation of the other common species of birds found at Point Reyes.
4. Refer to the second to last page of the *Birds of Point Reyes National Seashore* newspaper. Have students research the threatened and endangered or nonnative species of Point Reyes National Seashore.

How Can I Choose and Complete the Best Stewardship Project?



Post-Visit Lesson Plan

The final lesson for this unit synthesizes all previous learning experiences. Students have gained an understanding of resident birds and their habitats. Now it's time to take action and put their experience and knowledge into use. Teachers may choose from eight different activities.

Time required: varies

Location: classroom, school yard, or community

Suggested group size: entire class

Subjects: biology, art, computer skills, community service

Concepts covered: stewardship, educating others,
environmental responsibility

Written by: Christie Denzel Anastasia, National Park Service

Last updated: 02/22/02

Student Outcomes

At the end of this activity, the students will be able to:

- Synthesize all other pre-visit, on-site, and post-visit lessons from this guide
- Plan and implement an environmental stewardship activity to benefit the ecosystem they live in and depend upon

National Science Standard Links (grades 5-8)

This activity is linked to the National Science Standards in the following areas:

- Content Standard F - Science in personal and social perspectives; Populations, resources, and environments.

Vocabulary

stewardship





Procedures

1. **Decide on Lesson**

Review the Teacher Information sheet **Identifying Resident Birds: Environmental Stewardship Projects**. This resource explores the range of stewardship projects your class can choose from depending on time, need, and interest. Many of the projects are interdisciplinary and may fulfill educational standards for other subject areas.

2. **Introduce Concept of Environmental Stewardship**

Begin a discussion of who has responsibilities for natural resources. There are federal agencies such as the National Park Service and the United States Forest Service, state agencies such as California Fish and Game, and local organizations. Introduce the concept that organizations such as schools and individuals such as students also have responsibility.

Every day we decide on an individual level what our impact will be on the environment based on our actions. It's usually positive or negative, rarely neutral.

3. **Lesson Options**

- **Feeding Birds Safely: Important information about bird feeders** Activity Sheet
- **Create Raptor Silhouettes** Activity Sheet
- **Steps to Improving Songbird Habitat on Your Land** Activity Sheet
- Project FeederWatch
- The Great Backyard Bird Count
- Christmas Bird Count
- International Migratory Bird Day (IMBD)
- Cats Indoors!

4. **Assist with Evaluation of "Creating Coastal Stewardship through Science"**

Please share your project ideas and results! If you develop a website, host a "Coastal Stewardship Day", or participate in a beach cleanup, let us know by sending photos, stories, or student materials. Call (415) 464-5139 to leave a message with the Education Coordinator of Point Reyes National Seashore.



Identifying Resident Birds: Environmental Stewardship Projects

Feeding Birds Safely: Important information about bird feeders one lesson

If anyone feeds birds, they should avoid doing more harm than good. Students will teach proper behaviors for feeding birds by sharing information from the **Feeding Birds Safely** handout following this lesson plan. Students should be encouraged to develop creative ways to encourage and correct behaviors beneficial to birds. Some ways to share this information would be to create informational posters or a storybook that can be used to educate adults.

Create Raptor Silhouettes one lesson

Songbirds frequently fly into windows on houses and office buildings because they are unable to differentiate between glass and open sky. The clear glass often reflects trees, plants, and sky, confusing the birds. As a result, birds fly into them and sometimes die. Silhouettes may help to break up the reflection and scare birds away because of their raptor shapes. Students will need to increase the size of the raptors by using a photocopy machine or increasing the size with a grid method. (These silhouettes follow this lesson.) Students will also need dark construction paper, scissors, and tape. Once the silhouettes are completed, tape them on windows. Encourage students to make more for their homes or other classrooms at your school.

Steps to Improving Songbird Habitat on Your Land long-term project

Read the **Steps to Improving Songbird Habitat on Your Land** Activity Sheet and decide if there are specific possibilities for students to improve the schoolyard habitat. Students could conceivably participate in “The Great Backyard Bird Count” prior to and after improving the habitat to determine their success.

Project FeederWatch depends on individual commitment

Currently a winter-long survey is being conducted by thousands of participants throughout the U.S. and Canada by counting the kinds and numbers of birds at feeders. They send their data back to the Cornell Lab of Ornithology scientists through the Internet or by paper data forms. Participants pay an annual fee that covers project costs; they receive a research packet that includes an instruction booklet, data form booklet, bird identification poster, tips for feeding and watching birds, and more. Contact Project FeederWatch at 1-800-843-2473 or <http://birds.cornell.edu/PFW/>



The Great Backyard Bird Count

depends on individual commitment

Join “The Great Backyard Bird Count” to count the birds in your backyard, schoolyard, and community. Submissions are entered online and your count will help to map the distribution of North America’s winter bird residents. For more information and to see results from previous counts, please visit

<http://birdsource.cornell.edu/gbbc/>

Christmas Bird Count

one day a year commitment

Christmas Bird Counts are run every year from December 14 to January 5. For more information on count location and other bird-related information, please visit <http://birdsource.org>

International Migratory Bird Day (IMBD)

annual event

IMBD is an annual event created by Partners in Flight to increase public awareness of the factors that may contribute to declines in bird populations. Each year, individuals organize special events on a specific day in May to raise public consciousness and celebrate successes. A variety of materials is available to those celebrating IMBD. Each year, products specific to the annual theme of IMBD are produced, including posters, T-shirts, and publications, and offered in a Product Catalog. General bird- or conservation-related items are also offered in Product Catalog; others are available through IMBD sponsors. You may also register your IMBD event in the special events online database or find out about events near you by querying the database. For additional information about IMBD, contact the IMBD Information Center at 703-358-2318 or visit at www.americanbirding.org/imbd/imbdgen.htm

Cats Indoors!

depends on individual commitment

The American Bird Conservancy has launched a citizen education and action campaign to end the massive and unnecessary loss of birds and other wildlife to predation by domestic cats. Scientists estimate that free-roaming cats (owned, stray, and feral) kill hundreds of millions of birds and possibly more than a billion small mammals in the U.S. each year. Cats kill not only birds that frequent our backyards, such as the eastern towhee, American goldfinch, and song sparrow, but also WatchList species such as the snowy plover, wood thrush, and black-throated blue warbler, and endangered species such as the least tern and piping plover. Not only are birds and other wildlife at risk, but cats who roam free often lead short and painful lives, living on average less than 5 years, whereas indoor cats often live to 17 or more years of age.



The American Bird Conservancy has prepared informative educational materials on the impact of cats on birds, including documentation on cat predation, health hazards, and other dangers associated with free-roaming cats, legislative solutions, and practical advice on how to convert an outdoor cat into a contented indoor pet. These materials were prepared with the assistance of a technical advisory committee with representatives from the animal welfare, conservation (including National Audubon Society), veterinary, and scientific communities. For more information visit **<http://www.abcbirds.org>** or contact:

Cats Indoors!

The Campaign for Safer Birds and Cats

American Bird Conservancy

1834 Jefferson Place, NW

Washington, DC 20036



Feeding Birds Safely: Important information about bird feeders!

There are many types of bird feeders on the market and some are designed to attract specific bird species. Instead of buying a bird feeder, consider native plant species as natural feeders on your land. Avoid feeding birds during their breeding season (April through August), as feeders can act as a major food source for avian predators and parasites, such as jays and brown-headed cowbirds. For additional information on bird feeding, see the National Audubon Society's Project Feederwatch webpage at www.audubon.org

Improving your backyard habitat with birds in mind will attract more and different birds over the long term, benefit bird populations for the future, and help keep common birds common. For more information, see the Point Reyes Bird Observatory's website at www.prbo.org and the National Wildlife Federation's website at www.nwf.org

Tips for Keeping Birds Safe at Feeders

- Put feeders in CAT-FREE ZONES. If you have outdoor cats in your neighborhood, do not attract birds. Domestic cats are excellent hunters and will kill birds.
- PROTECT YOUR FEEDERS. Protection from predators is very important at feeders. This can be accomplished through placing feeders in areas of natural vegetation, such as shrub cover.
- SHAKE OUT FEEDERS well before refilling (scrape when necessary).
- SCRUB OUT FEEDERS with 1:9 bleach/water solution, to prevent *E.coli* (bacteria) transmission through feces and any mold accumulation.

Hummingbird Feeder Safety

Hummingbirds provide us with much enjoyment, and feeders can be used as excellent educational tools, but they require strict maintenance. Consider adding to your backyard or schoolyard flowering plants, shrubs, and trees as lower maintenance and natural hummingbird feeders!

Cleaning your hummingbird feeder

- Hummingbirds can contract diseases from dirty feeders. Clean your feeder, every time you fill it, with a mild solution of dishwashing liquid and hot water, using a bottle brush and toothbrush to really clean out the crevices.
- Hummingbirds need consistently filled stations; if you go away often, don't keep a feeder.

Filling your feeder

- Use a sugar solution of 1:4 sugar/water (i.e., 1 cup sugar and 4 cups water), boil briefly, then store in a refrigerator until needed.
- Please do not use artificially colored solutions; they have been linked with birth and hatching abnormalities in hummingbirds.

Dealing with insect and ant visitors

- Smear a little mineral oil on the feeding port and hanging wire. This will keep bees, wasps, and ants at bay.

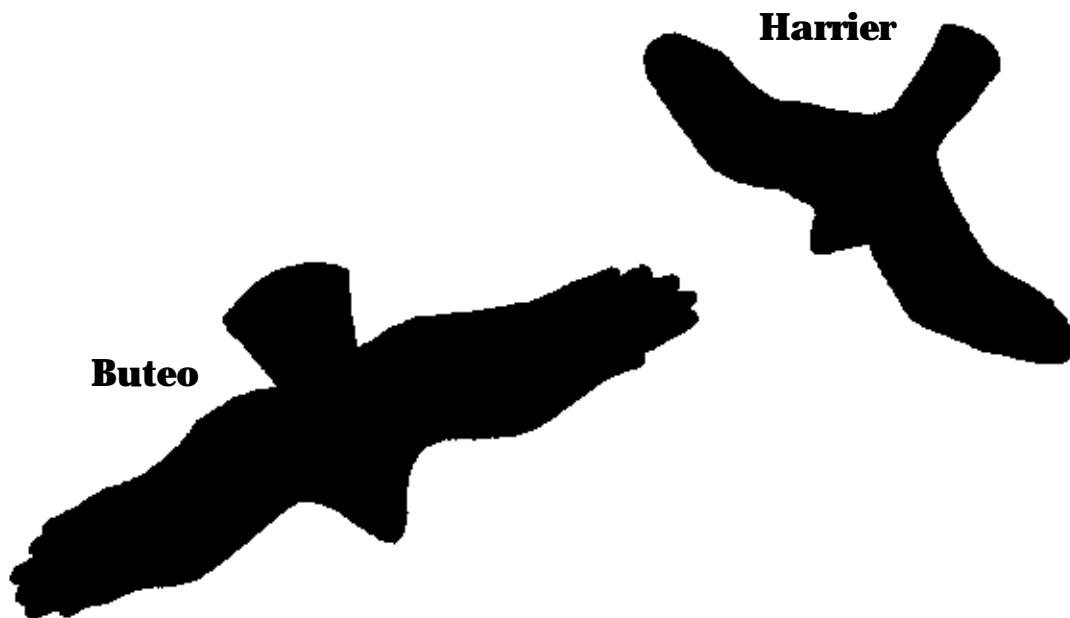
For more information, please contact the Education Specialist at Point Reyes Bird Observatory, (415) 868-0655



Name _____ Date _____

Activity Sheet

Raptor Silhouettes



Buteo

Harrier



Vulture



Accipiter



Falcon



Steps to Improving Songbird Habitat on Your Land

Breeding season is a critical time for both resident and migratory birds in California. Habitat loss and nest failure are two of the main contributing factors to bird population declines in our state. While many people we speak to express their enjoyment of feeding and viewing wildlife in their yards and on ranches, conventional landscaping does not always create the best habitat structure. Songbird breeding season lasts from late March through August in California. There are many steps that can be taken to make this time a productive one for birds on your land. We'd like to encourage wildlife lovers to go beyond simply attracting birds to their yards. Below are suggestions for creating better breeding habitat for nesting songbirds on your land. By providing habitat - especially natural nest sites and foraging areas - you can play an important role in ensuring healthy bird populations for the future.

Providing nesting sites

Native vegetation provides the best nest cover for breeding birds. We highly recommend planting native shrubs and trees in multi species clumps to provide the most nest sites with the best cover.

- Plant shrubby willow species in clumps.
- Plant native sedges and grasses.
- Leave dead trees and limbs for cavity-nesting species such as woodpeckers, bluebirds, nuthatches, and titmice. Overall, natural cavities provide better nest sites than bird boxes.
- Provide nest material such as grass clippings, leaf litter, and animal hair.

Protect riparian (streamside) areas

- Re-vegetate riparian zones with native plant species. Riparian habitat is heavily used by songbirds for nest sites, foraging, shelter for young birds, and migration rest stops.

Declare your land a bird sanctuary

Designate areas of your land "bird-friendly" by doing the following:

- Minimize human disturbance (e.g., recreational vehicles, construction, pet activity) during breeding season.
- Create networks of "bird sanctuaries" by working with neighbors and local conservancies. Connected habitat patches are the most valuable to birds.
- The National Wildlife Federation certifies backyards, schoolyards, and workplaces "wildlife friendly" through their Backyard Wildlife Habitat Program. Visit www.nwf.org for more information.

To reduce pressure from introduced (nonnative) predators:

- Keep cats indoors, especially during breeding season when vulnerable young birds are just out of the nest. Bells on the collar are not enough.
- Reduce feral cat populations.



Activity Sheet

Name _____ **Date** _____

Mow Smart!

Set aside "no-mow" areas, which will provide nest sites and shelter for several bird species, especially goldfinches, buntings, and towhees.

Mow around native tree saplings and shrubs. Even poison oak, a native shrub species, has high wildlife value. Consider leaving it in your "bird sanctuary."

Leave brush piles for shelter, foraging, and nest sites.

Learn the birds on your land

Buy a field guide and binoculars.

Take a workshop or join a bird walk in your area.

**Data show that quality habitat brings more
and different birds to an area, especially
when habitat patches are connected.**

**Work with neighbors and local conservancies
to create a network of "bird sanctuaries" in
your community.**



Information courtesy of
California Partners in Flight
and the Riparian Habitat Joint Venture.

POINT REYES NATIONAL SEASHORE

This list is incomplete, but is meant to provide ideas for additional teaching resources.



Education and Reference Materials

Braus, Judy, editor. **Ranger Rick's Nature Scope: Birds, Birds, Birds!** Washington, D.C.: National Wildlife Federation, 1985.

Choate, Ernest A. **The Dictionary of American Bird Names.** Boston: The Harvard Common Press, 1985.

Ehrlich, Paul, Davin Dobin and Darryl Wheye. **The Birders Handbook.** New York: Simon and Schuster, Inc., 1998.

Forshaw, Joseph, Steve Howell, Terence Lindsey, and Rich Stallcup. **A Nature Company Guide: Birding.** San Francisco: Time-Life Books, 1994.

Latimer, Jonathan and Karen Stray Nolting. **Peterson Field Guides For Young Naturalists: Birds of Prey.** Boston: Houghton Mifflin Company, 1999.

Latimer, Jonathan and Karen Stray Nolting. **Peterson Field Guides For Young Naturalists: Backyard Birds.** Boston: Houghton Mifflin Company, 1999.

National Geographic Society. **Birds of North America.** Washington, D.C.: National Geographic Society, 1999.

Peterson, Roger. **Western Birds.** New York: Houghton Mifflin Company, 1990.

Peterson, Roger. **Peterson First Guides: Birds.** New York: Houghton Mifflin Company, 1980.

Sibley, David Allen. **The Sibley Guide to Birds.** Maryland: Knopf, 2000.

Sibley, David Allen. **The Sibley Guide to Bird Life and Behavior.** Maryland: Knopf, 2001.

Stallcup, Rich. **Field Checklist of Birds: Point Reyes National Seashore.** Point Reyes: Point Reyes National Seashore Association, 2000.



Related Publications

United States Environmental Protection Agency

EPA's National Service Center for Environmental Publications

1-800-490-9198 or **www.epa.gov**

Pamphlets such as "Climate Change and Birds: Change On The Wing" are available free of charge.

Internet Addresses

American Bird Conservancy

www.abcbirds.org

American Birding Association

www.americanbirding.org

Audubon Society

www.audubon.org

Classroom Bird Watch

www.birdsource.cornell.edu/cfw/

Department of Defense Partners in Flight

www.dodpif.org

Journey North

www.learner.org/k12

National Audubon Society

www.audubon.org

The North American Breeding Bird Survey

www.mbr-pwrc.usgs.gov/bbs/bbs.html

Patuxent Wildlife Research Center

www.pwrc.usgs.gov/bbl/

Excellent photos and explanation of bird banding.

Point Reyes Bird Observatory

www.prbo.org

The Raptor Center

www.raptor.cvm.unm.edu

The Turkey Vulture Society

www.accutek.com



Virtual Birding
www.virtualbirder.com

WatchList 4Kids
www.audubon.org/bird/watch/kids/index.html

Workshops and Classes

PRNSA Field Seminars

Point Reyes National Seashore Association
Point Reyes Station, CA, 94956
(415) 663-1200
www.ptreyes.org

Point Reyes Bird Observatory Conservation Science

4990 Shoreline Highway
Stinson Beach, California 94970
Email: prbo@prbo.org
tel: 415.868.1221
fax: 415.868.1946

Golden Gate Raptor Observatory

Building 201, Fort Mason
San Francisco, CA 94123
(415) 331-0730
Email: ggro@ggnpa.org
Raptor Hotline recording (415) 776-1607 Ext. 500